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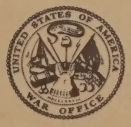
DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR AND ORGANIZATIONAL MAINTENANCE MANUAL FOR

TEST SET, COMPASS SYSTEM AN/ASM-63

(LEAR PART NO. LT-3310B-602)



HEADQUARTERS, DEPARTMENT OF THE ARMY

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WARNING

Be careful not to contact the 28-volt dc, the 115-volt ac, or the 200-volt ac input connections when testing or servicing components of Compass Controlled, Directional Gyroscope System Type MA-1. Remove all power from the test set when making test connections.

DON'T TAKE CHANCES!

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CHAPTER 1

INTRODUCTION

1. Scope

This manual describes Test Set, Compass System AN/ASM-63 (Lear Part No. LT-3310B-002) and covers its installation, operation and operator and organizational maintenance. It includes cleaning and inspection of the equipment, and replacement of parts available to first and second echelons of maintenance.

2. Forms and Records

a. Unsatisfactory Equipment Reports. Fill out and forward DA Form 468, Unsatisfactory Equipment Report, as prescribed in AR 700-38.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6, Report of Damaged or Improper Shipment, as prescribed in AR 700-58.

c. Preventive Maintenance Forms (fig. 9 and 10). Prepare DA Form 11-266, Maintenance Check List for Signal Equipment (Test Equipment), in accordance with instructions on the form.

d. Comments on Manual. Forward all other comments on this manual direct to the Commanding Officer, U.S. Army Signal Materiel Support Agency, ATTN: SIGMS-PA2d, Fort Monmouth, N.J.

3. Purpose and Use

a. Purpose. The purpose of Test Set, Compass System AN/ASM-63 is to provide a quick and accurate means of bench testing Compass Controlled Directional Gyroscope System Type MA-1 or any of its components. The AN/ASM-63 provides facilities for connecting, switching and monitoring of the inputs to, or the outputs from, the MA-1 or its components for bench testing.

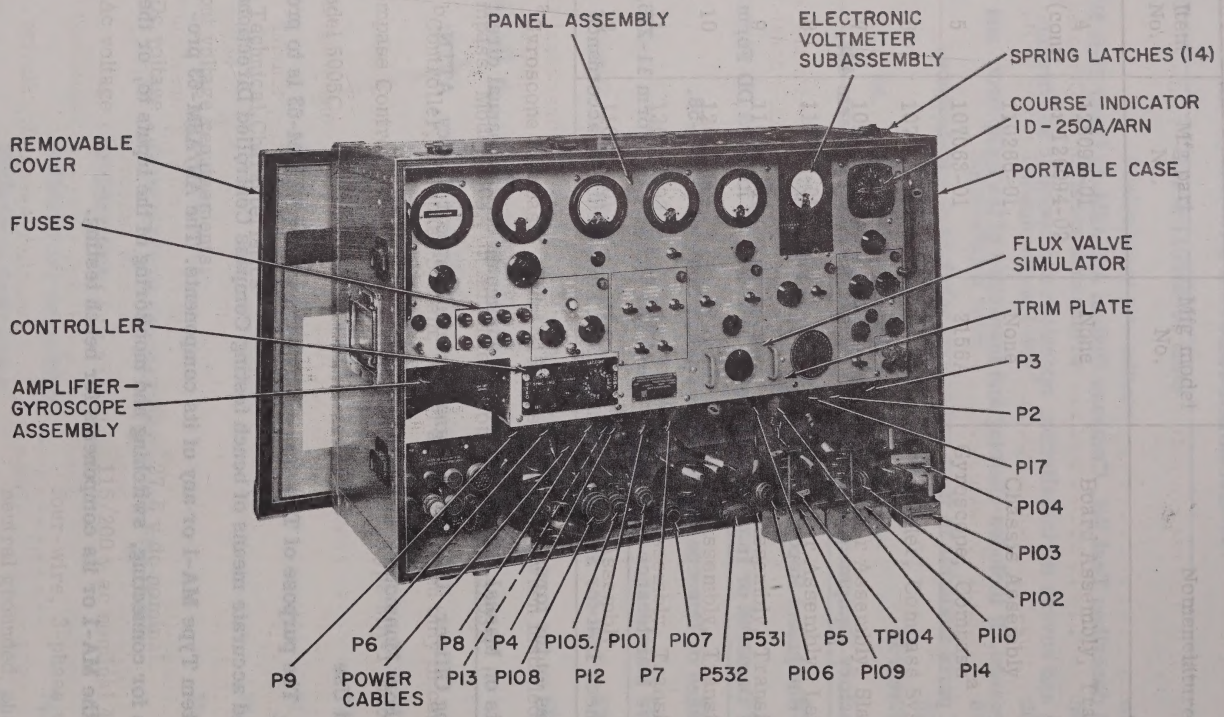


Figure 1. Test Set, Compass System AN/ASM-63 with cover removed.

b. Use. The AN/ASM-63 is used with the test equipment listed in paragraph 9 to service and adjust the MA-1 or its components at third through fifth echelons of maintenance. It is also used in initial adjustments of the MA-1 to insure accurate calibration.

c. Components. The components of the various configurations of Compass Controlled Directional Gyroscope System Type MA-1 which are tested by the AN/ASM-63 are listed in the table below.

Item No.	Mfg part No.	Mfg model No.	Nomenclature
1	None	5005A	Compass Controlled Directional Gyroscope System Type MA-1 consisting of:
	107062-01	3303A	Amplifier, Compass
	107063-01	2156A	Gyroscope, Compass
	107064-01	3801A	Controller, Compass System
2	None	5005C	Compass Controlled Directional Gyroscope System MA-1 consisting of:
	126091-01	3303B	Amplifier, Compass
	107063-01	2156A	Gyroscope, Compass
	107064-01	3801A	Controller, Compass System
3	107062-01	3303A	Amplifier, Compass consisting of:
	109977-01	None	Amplifier Assembly, Slaving
	110214-01	None	Amplifier Assembly, Leveling
	110348-01	None	Board Assembly, Transformer
	110266-01	None	Chassis Assembly
4	126091-01	3303B	Amplifier, Compass consisting of:
	109977-01	None	Amplifier Assembly, Slaving
	110214-01	None	Amplifier Assembly, Leveling

c. Components (cont).

Item No.	Mfg part No.	Mfg model No.	Nomenclature
4 (cont)	126094-01 or 126094-02	None	Board Assembly, Transformer
	110266-01	None	Chassis Assembly
5	107063-01	2156A	Gyroscope, Compass[a]
6	107064-01	3801A	Controller, Compass System[b]
7	109977-01	None	Amplifier Assembly, Slaving
8	110214-01	None	Amplifier Assembly, Leveling
9	110348-01	None	Board Assembly, Transformer
10	126094-01	None	Board Assembly, Transformer
11	126094-02	None	Board Assembly, Transformer
12	110266-01	None	Chassis Assembly

[a]Gyroscope Compass, Model 2156A is tested only when installed in Amplifier, Compass, Model 3303A or Amplifier, Compass Model 3303B.

[b]Controller, Compass System, Model 3801A is tested only in conjunction with Compass Controlled Directional Gyroscope System Type MA-1 Model 5005A or Model 5005C.

4. Technical Characteristics

Input voltage requirements:

Dc voltage . . . . . 27.5 v dc nominal.

Ac voltage . . . . . 115/200 v ac nominal 400 ±4-cps four-wire, 3-phase wye with neutral grounded; phase rotation A-B-C.

Output voltages:

Dc voltages	27.5 v dc nominal (to components under test).
Ac voltage	115/200 v ac, 400 ±4 cps, four-wire, 3-phase wye with neutral grounded; phase rotation A-B-C (to system, amplifier, or transformer board under test): 26 v ac single phase to external precision indicator.

Simulated:

Simulated SYNC IND meter signal	50 microampere, reversible polarity.
Simulated slaving signal	0 to 0.008 volt ± 0.001, 800 cps, in-phase or 180° out-of-phase.
Simulated leveling signal	0 to 5 volt ± 0.1, 400 cps, phase B or phase b + 180°.
Simulated magnetic amplifier signal	0 to 1 milliampere, reversible polarity.

Meters:

Meter identification	FREQUENCY.
Range	380 to 420 cycles.
Accuracy	±0.5 percent of indicated frequency.
Meter identification	AC VOLTS.
Range	105 to 125 volts ac.
Accuracy	±0.6 percent of center scale.
Meter identification	AC CURRENT.
Range	0 to 150 milliamperes ac.
Accuracy	±2 percent of full scale.

Meter identification	DC VOLTS.
Range	0 to 60 volts dc.
Accuracy	±2 percent of full scale.
Meter identification	DC CURRENT.
Range	100-0-100 microamperes dc; 1-0-1 milliampere dc.
Accuracy	±2 percent of full scale.
Meter identification	Electronic voltmeter subassembly.
Ranges	0 to 0.01; 0 to 0.03; 0 to 0.1; 0 to 0.3; 0 to 1; 0 to 3; 0 to 10; 0 to 30; 0 to 100; and 0 to 300 volts ac.
Accuracy (all ranges)	±3 percent of full scale.

5. Table of Components

Quantity (ea)	Item	Height (in.)	Depth (in.)	Width (in.)	Weight (lbs)	Manufacturer's part No.
1	Simulator, Compass Transmitter SM-272/AN					
1	Cable Assembly, Special Purpose, Electrical (Lear Part Nr 998930-01-01) 3 ft long					
1	Cable Assembly, Special Purpose, Electrical (Lear Part Nr 998935-01-01) 3 ft long					
1	Cable Assembly, Special Purpose, Electrical (Lear Part Nr 998936-01-01) 4 ft long					
1	Cable Assembly, Special Purpose, Electrical (Lear Part Nr 998937-01-01) 4 ft long					
1	Cable Assembly, Special Purpose, Electrical (Lear Part Nr 998940-01-01) 5 ft long					
1	Cable Assembly, Special Purpose, Electrical (Lear Part Nr 998941-01-01) 5 ft long					

5. Table of Components (cont)

Quantity (ea)	Item	Height (in.)	Depth (in.)	Width (in.)	Weight (lbs)	Manufacturer's part No.
1	Cable Assembly, Special Purpose, Electrical (Lear Part Nr 998942-01-01) 5 ft long					
1	Cable Assembly, Special Purpose, Electrical (Lear Part Nr 998946-01-01) 5 ft long					
1	Cable Assembly, Special Purpose, Electrical (Lear Part Nr 998961-01-01) 5 ft long					
1	Cable Assembly, Special Purpose, Electrical (Lear Part Nr 998962-01-01) 5 ft long					
1	Cable Assembly, Special Purpose, Electrical (Lear Part Nr 998964-01-01) 3 ft long					
1	Cable Assembly, Special Purpose, Electrical Branched (Lear Part Nr 998968-01-01) 3 ft long					
1	Amplifier, Compass, Model 3303B, including the following:[a]	9-7/16	8-15/16	6-1/4	6 (approx)	126091-01

5. Table of Components (cont)

Quantity (ea)	Item	Height (in.)	Depth (in.)	Width (in.)	Weight (lbs)	Manufacturer's part No.
1	Amplifier Assembly, Slaving[a] (Lear Part Nr 109977-01)					
1	Amplifier Assembly, Leveling[a] (Lear Part Nr 110214-01)					
1	Board Assembly, Transformer[a] (Lear Part Nr 126094-01 or 126094-02)					
1	Chassis Assembly (Lear Part Nr 110266-01)[a]					
1	Gyroscope, Compass Lear Model[a] 2156A	7-5/8	5-1/4	5-1/4	9 (approx)	107063-01
1	Controller, Compass System[a] Lear Model 3801A	2-5/8	4-3/4	5-3/4	1.3 (approx)	107064-01

[a]Components of Compass Controlled Directional Gyroscope System Type MA-1 issued with the AN/ASM-63 for use as standards, and to facilitate testing.

6. Common Names

a. Test Set, Compass System AN/ASM-63. The following table lists the components of the AN/ASM-63 (test set) and the common names assigned to each component.

Nomenclature	Common name
Simulator, Compass Transmitter SM-272/AN (Lear Part Nr. LT-3316)	Flux valve simulator
Cable Assembly, Special Purpose, Electrical (Lear Part Nr 998930-01-01)	Cable W12
Cable Assembly, Special Purpose, Electrical (Lear Part Nr 998935-01-01)	Cable W14
Cable Assembly, Special Purpose, Electrical (Lear Part Nr 998936-01-01)	Cable W7
Cable Assembly, Special Purpose, Electrical (Lear Part Nr 998937-01-01)	Cable W8
Cable Assembly, Special Purpose Electrical (Lear Part Nr 998940-01-01)	Cable W3
Cable Assembly, Special Purpose, Electrical (Lear Part Nr 998941-01-01)	Cable W5
Cable Assembly, Special Purpose, Electrical (Lear Part Nr 998942-01-01)	Cable W9
Cable Assembly, Special Purpose, Electrical (Lear Part Nr 998946-01-01)	Cable W4
Cable Assembly, Special Purpose, Electrical (Lear Part Nr 998961-01-01)	Cable W10
Cable Assembly, Special Purpose, Electrical (Lear Part Nr 998962-01-01)	Cable W6
Cable Assembly, Special Purpose, Electrical (Lear Part Nr 998964-01-01)	Cable W11
Cable Assembly, Special Purpose, Electrical Branched (Lear Part Nr 998968-01-01)	Cable W15

a. Test Set, Compass System AN/ASM-63 (cont).

Nomenclature	Common name
Gyroscope, Compass, Lear Model 2156A	Gyroscope[a]
Amplifier, Compass, Lear Model 3303A or	
Amplifier, Compass, Lear Model 3303B	Amplifier[a]
Controller, Compass System Lear Model 3801A	Controller

[a]The gyroscope is normally mounted in the amplifier for operation and testing. The assembly is known as the amplifier-gyroscope assembly.

b. Compass Controlled Directional Gyroscope System Type MA-1. The following table lists the equipment and components tested by the AN/ASM-63 and their assigned common names.

Nomenclature	Common name
Compass Controlled Directional Gyroscope System MA-1	Compass system 5005A or compass system 5005C
Amplifier, Compass 107062-01 (Amplifier, Compass Model 3303A)	Amplifier Model 3303A
Amplifier, Compass 126091-01 (Amplifier, Compass Model 3303B)	Amplifier Model 3303B
Gyroscope, Compass	Gyroscope
Controller, Compass System	Controller
Amplifier Assembly, Slaving	Slaving amplifier
Amplifier Assembly, Leveling	Leveling amplifier
Board Assembly, Transformer 110348-01	Transformer board 110348-01
Board Assembly, Transformer 126094-01	Transformer board 126094-01

b. Compass Controlled Directional Gyroscope System Type MA-1 (cont).

Nomenclature	Common name
Board Assembly, Transformer 126094-02	Transformer board 126094-02
Chassis Assembly	Chassis

7. Description of Major Component

(fig. 1)

The test set consists of a panel assembly installed in a waterproof portable case, and 12 detachable cable assemblies. The case cover is removable and is secured to the case by means of 14 spring catches. The panel assembly has provisions to mount the controller and connect it to the test set. On the panel are the input power control and monitoring facilities; the panel assembly is divided into five test areas, an alternating-current (ac) electronic voltmeter subassembly, Course Indicator, ID-250A/ARN and a removable flux valve simulator.

8. Description of Minor Components

a. A 3-foot cable (W-12), terminated in multicontact connectors (P17 and P102), is provided to connect an external precision indicator to the test set.

b. Six 5-foot cables (W6, W10, W 4, W9, W5, and W3), terminated in multicontact connectors (P4 and P101, P5 and TP104, P6 and P105, P7 and P106, P8 and P107, P9 and P108, respectively) are provided to connect the amplifier-gyroscope assembly to the test set. Three of the 5-foot cables (W3, W5 and W9) are also used to connect the amplifier, without the installed gyroscope, to the test set.

c. Two 4-foot cables (W7 and W8), terminated in multicontact connectors (P12 and P531, P13 and P532), along with cable W3, W5 and W9, connect the amplifier (less gyroscope) to the test set.

d. A 3-foot cable (W14), terminated in a multicontact connector (P2) and a printed circuit connector (P110), is provided to connect the slaving amplifier to the test set.

e. A second 3-foot cable (W11), terminated in a multicontact connector (P14) and a printed circuit connector (P109), is provided to connect the leveling amplifier to the test set.

f. A 3-foot branched cable (W15), terminated in a multicontact connector (P3) and two printed circuit connector (P103 and P104) is provided to connect either transformer board to the test set.

g. Ac and dc power is applied to the test set through two 8-foot cables (W1 and W2).

9. Additional Equipment Required

a. Equipment Furnished with Test Set (fig. 1). Three system components consisting of amplifier (Lear, Model No. 3303B), gyroscope (Lear, Model 2156A), and controller (Lear, Model 3801A) are included to provide a set of standard components against which another system, component, or subassembly may be compared to determine proper operation. The system, component, or subassembly to be tested is substituted for the corresponding standard component or subassembly.

Note. The gyroscope is normally installed in the amplifier and can be tested only after installation in an amplifier.

b. Equipment Required But Not Furnished with Test Set.

(1) Three-axis table. A 3-axis (yaw, roll and pitch) table capable of operating through a total angle of 3° and 15° (Scorsby motion) at a speed of 5 to 7 oscillations per minute and which reverses direction in roll and pitch at least once each minute in equal increments. (Table Scorsby, Model No. 1406R, or equivalent, with suitable adapters, is required to perform system and gyroscope drift tests.)

(2) Vibration table. A vibration table capable of 0.002 to 0.005 inch double-amplitude vertical excursion, with a 15 pound load at a frequency of 1,500 to 2,000 cycles per second, is required to perform system and gyroscope tests.

(3) Tilt table. A level-type tilt table capable of 15° tilt, right or left, from the amplifier and gyroscope vertical axis is required to perform system and gyroscope tests.

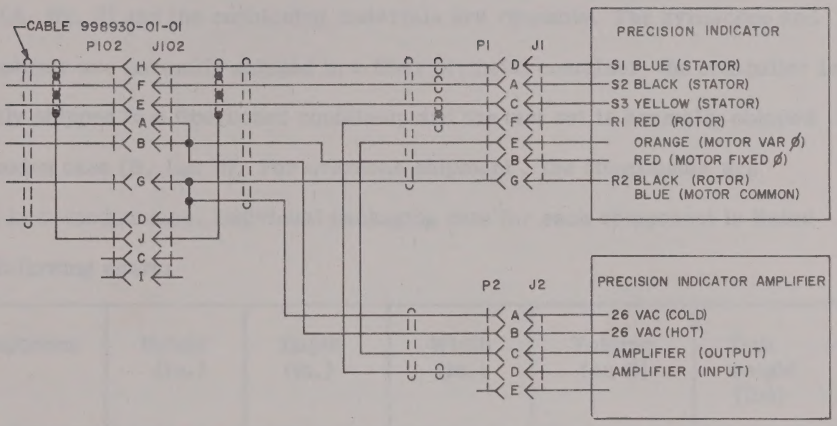
(4) Azimuth table. A level-type azimuth table capable of rotation through 360° and read out at 0.25°, 2°, and 10° clockwise and counterclockwise from a zero point or index is required.

(5) Oscilloscope. Oscilloscope OS-46/U, or electrical equivalent, is required to perform system, component, and subassembly phasing and phase-shift tests.

(6) Precision indicator. A Bendix Servo Synchro Indicator (Bendix part No. 13622-1-A), or electrical equivalent, is required to perform system and gyroscope slaving and drift tests. The precision indicator must read true angular deflection within ±3'. The precision indicator requires a precision indicator amplifier ((7) below) and a cable assembly ((8) below).

(7) Precision indicator amplifier. A Bendix Amplifier Vacuum Tube Servo (Bendix part No. 13633-1-B or 13633-3-A), or electrical equivalent is required for operation of the precision indicator ((6) above).

(8) Cable assembly. The cable assembly shown in figure 2 must be fabricated to connect the precision indicator ((6) above) and precision indicator amplifier ((7) above) together and to the test set.



NOTES:

1. J1 IS A PART OF THE PRECISION INDICATOR AND IS AN MS3102A16S1P CONNECTOR.
2. J2 IS A PART OF THE PRECISION INDICATOR AMPLIFIER AND IS AN MS3102A14S5P CONNECTOR.
3. P102 IS A PART OF CABLE 998930-01-01 AND IS AN MS3106A18-1S CONNECTOR.
4. J102 IS AN MS3101A18-1P CONNECTOR.
5. P1 IS AN MS3106A16S1S CONNECTOR.
6. P2 IS AN MS3106A14S5S CONNECTOR.
7. ALL WIRE IS NO. 20 AWG INSULATED, SHIELDED AS SHOWN.

8609

Figure 2. Cable assembly fabrication schematic diagram.

CHAPTER 2

INSTALLATION

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

10. Unpacking

a. Packaging Data. When packed for shipment, the components of the Test Set are packed in individual containers (A and B, fig. 3). The fiber or metal container (A, fig. 3) and the cushioning materials are reusable. The gyroscope and the amplifier are normally shipped in a fiber or metal container; the controller is normally shipped in a fiberboard container; and the test set is normally shipped in a wooden case (B, fig. 3). For overseas shipment , the components are packed in a wooden case. Individual packaging data for each component is listed in the following chart.

Component	Height (in.)	Depth (in.)	Width (in.)	Volume (cu ft)	Unit weight (lbs)
Test set	28	19	39	11.5	180
Amplifier	16	15 (dia)	15 (dia)	2.1	20
Gyroscope	22	15 (dia)	15 (dia)	2.8	29
Controller	5-3/4	7-1/2	8-3/4	0.22	4

b. Removing Contents from Fiber or Metal Container (A, fig. 3).

(1) Remove the sealing ring from the container by cutting the lead seal, then removing the screw, washer, and nut (not shown).

(2) Lift off the cover and remove the formed latex padding (containing the component) from the container.

(3) Separate the formed latex padding sections; make sure that the component does not fall when the sections are separated.

(4) Remove the component from the barrier material bag.

c. Removing Contents from Wooden Crate (B, fig. 3). Perform the procedures in (1) through (4), below as appropriate, to remove components from a wooden crate.

(1) Remove the nails from the wooden cover and one side with a nailpuller. Cut the metal straps and remove the cover and side. Do not pry the wooden container apart. Prying may cause damage to the test set.

(2) Open the moistureproof barrier and remove the fiberboard container housing the component.

(3) Open the fiberboard container and remove the fiberboard spacer, and the barrier material bag containing the component.

(4) Open the barrier material bag and remove the component.

d. Repackaging Equipment. When repacking of a component is required, use the original packing containers (b and c above), if available. If the original packing containers are not available, determine the amounts of packaging materials required to repack the component and refer to SB 38-100 for additional information.

Caution: Do not ship the test set with any of the system components installed in their respective storage areas. The gyroscope must be shipped separately in a shipping container lined with padding material equivalent to that used for original shipment to prevent damage to the gyroscope.

11. Checking Unpacked Equipment

a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, refer to paragraph 2.

b. Check the equipment against the packing list. When no packing list accompanies the equipment, use the table of components (para 5) as a general check.

12. Placement of Equipment

a. Release the 14 spring catches securing the cover to the test set and remove the cover.

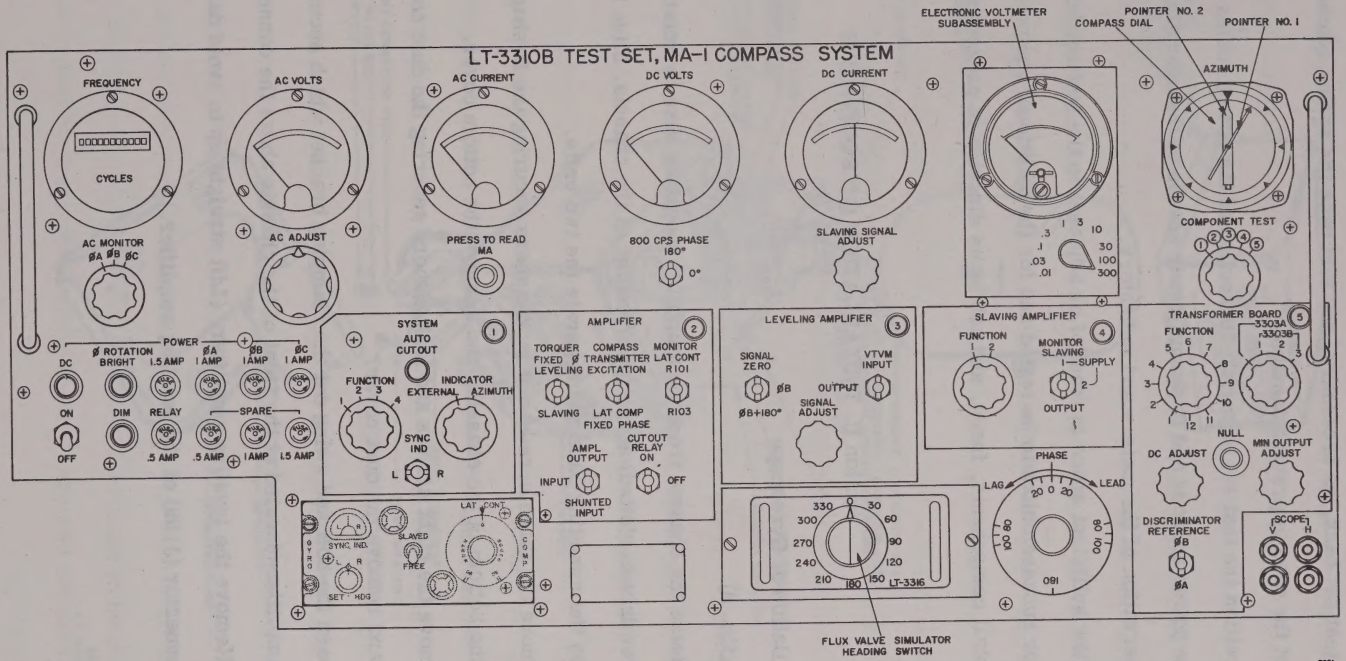


Figure 3. Typical packaging diagram.

b. Place the test set on a bench or other suitable support as shown in figure 1. Tilt the test set back, as necessary, and fold back the spring catches along the bottom of the case to prevent damage.

c. Position the test set to permit connection of the power cables to the appropriate power sources and to permit ready access to the operating controls and easy observation of the meters and indicators.

d. Allow sufficient space in front of or adjacent to the test set for the components or subassemblies to be tested and for the additional equipment.

e. Install components, fuses, and cables as directed in paragraphs 13 through 17.

Section II. INSTALLATION OF EQUIPMENT

13. Installation of Gyroscope

(fig. 4)

a. Release the chassis from the amplifier mounting base by rotating the knurled knob (screwdriver-slotted) at the lower center of the chassis. Slide the chassis forward on the mounting base and separate the two units.

b. Remove the three screws and lockwashers securing the D-shaped bottom cover to the bottom of the chassis, and remove the bottom cover.

c. Remove the eight screws and lockwashers securing the dust cover to the chassis, and remove the dust cover.

d. Loosen the bolt and swing out the clamping bracket which secures the leveling amplifier (located at the front of the chassis above the connectors) to the chassis. Remove the leveling amplifier. (Lift straight up to avoid damage to the plug-in connector (J109) of the leveling amplifier.)

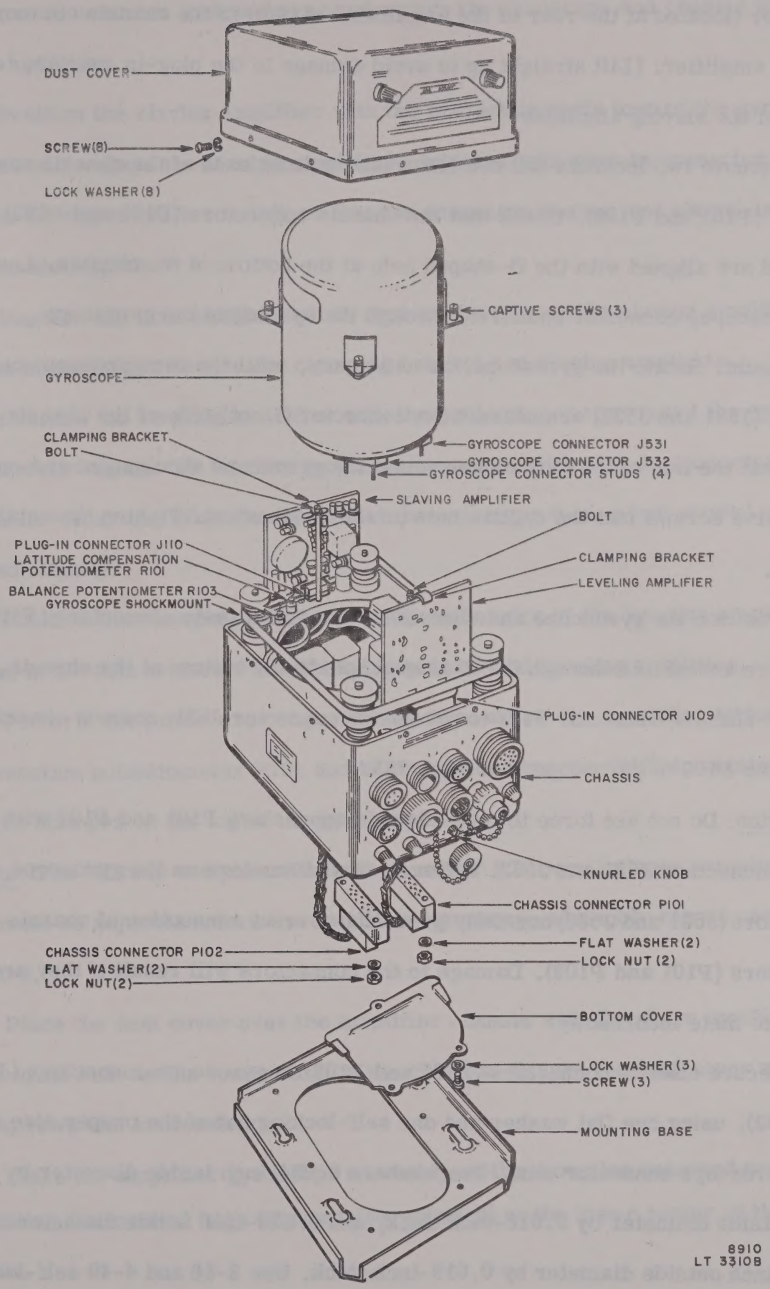


Figure 4. Chassis and gyroscope, exploded view.

e. Loosen the bolt and swing out the clamping bracket which secures the slaving amplifier (located at the rear of the amplifier chassis) to the chassis. Remove the slaving amplifier. (Lift straight up to avoid damage to the plug-in connector (J110) of the slaving amplifier.)

f. Remove two locknuts and two flat washers from each of the chassis connectors (P101 and P102). Check that the chassis connectors (P101 and P102) are free and are aligned with the D-shaped hole at the bottom of the chassis. Lower the gyroscope, connector end first, through the opening in the gyroscope shockmount. Rotate the gyroscope, as necessary, until the two gyroscope connectors (J531 and J532) are nearest the connector (front) side of the chassis.

g. Seat the feet of the gyroscope against the gyroscope shockmount and engage the captive screws into the captive nuts on the shockmount. Tighten the captive screws.

h. Position the gyroscope and chassis so that the chassis connectors (P101 and P102) are accessible through the D-shaped hole in the bottom of the chassis. Connect chassis connector P101 to gyroscope connector J531; connect chassis connector P102 to gyroscope connector J532.

Caution: Do not use force to mate chassis connectors P101 and P102 with gyroscope connectors J531 and J532. Different stud diameters on the gyroscope connectors (J531 and J532) normally prevent incorrect connection of chassis connectors (P101 and P102). Damage to the connectors will result if they are forced to mate incorrectly.

i. Secure chassis connectors (P101 and P102) to gyroscope connectors (J531 and J532), using one flat washer and one self-locking nut of the proper size on each gyroscope connector stud. Use washers 0.094-inch inside diameter by 0.140-inch outside diameter by 0.018-inch thick, and 0.118-inch inside diameter by 0.187-inch outside diameter by 0.018-inch thick. Use 2-56 and 4-40 self-locking nuts, respectively.

j. Replace the D-shaped bottom cover on the bottom of the chassis, secure it with three screws and lockwashers, and return the gyroscope and chassis to the vertical position.

k. Position the slaving amplifier with the projecting parts toward the gyroscope and carefully engage the slaving amplifier connector with plug-in connector J110. Seat the slaving amplifier firmly so that the connector O-ring (not shown) is compressed slightly.

l. Position the clamping bracket to rest on the edge of the slaving amplifier, and run in the bolt to secure the clamping bracket and slaving amplifier.

m. Position the leveling amplifier with the projecting parts toward the gyroscope and carefully engage the leveling amplifier connector with plug-in connector J109. Seat the leveling amplifier firmly so that the connector 0-ring (not shown) is compressed slightly.

n. Position the clamping bracket to rest on the edge of the leveling amplifier, and run in the bolt to secure the clamping bracket and leveling amplifier.

o. Perform the procedures of paragraph 26 to adjust the amplifier latitude compensation potentiometer R101 and balance potentiometer R103 to obtain the voltages stamped on the top of the gyroscope.

Note: The latitude compensation potentiometer R101 and balance potentiometer R103 must be adjusted before the amplifier-gyroscope assembly can be used as a standard.

p. Place the dust cover over the amplifier chassis with the spare fuseholders on the same side as the connectors on the chassis. Secure the dust cover with eight screws and lockwashers.

q. Place the amplifier gyroscope assembly on the mounting base and secure by rotating the knurled knob (screwdriver-slotted) at the lower center of the chassis.

r. Slide the amplifier gyroscope assembly into the storage area provided in the test set (fig. 1).

14. Installation of Controller

(fig. 1)

a. Remove test set connector P1 (visible through the panel opening) from the dummy connector. Bring the connector and cable out through the panel opening and connect test set connector P1 to connector J1 on the back of the controller.

b. Carefully slide the controller into the panel opening and secure the controller to the panel by means of the four Dzus-type fasteners on the controller.

15. Installation of Flux Valve Simulator

(fig. 1)

The test set is normally shipped with the flux valve simulator installed in the panel assembly. Perform the procedures of a through e below for those tests sets that do not have the flux valve simulator installed.

a. Remove the trim plate from the panel by loosening the Dzus-type fastener at each end.

b. Reach through the panel assembly flux valve simulator opening and bring connector P10 (not shown) and its cable out through the panel opening.

c. Connect test set connector P10 to connector J1 (not shown) on the side of the flux valve simulator.

d. Carefully slide the flux valve simulator into the panel opening.

e. Place the trim plate over the flux valve simulator and secure it with the Dzus-type fasteners.

16. Installation of Cables

(fig. 5)

a. Install an appropriate electrical connector on the end of cable W1 which will mate with the receptacle of the local ac power source.

Operator and Organizational Maintenance Manual

TEST SET, COMPASS SYSTEM AN/ASM–63 AND SIMULATOR, COMPASS TRANSMITTER SM–272/ASN

CHANGE No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *6 December 1963*

TM 11–6625–503–12, 30 August 1962, is changed as follows:

Page 7. Make the following changes:

After paragraph 1, add:

1.1. Index of Publications

Refer to the latest issue of DA Pam 310–4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment. DA Pam 310–4 is an index of current technical manuals, technical bulletins, supply manuals (types 4, 6, 7, 8, and 9), supply bulletins, lubrication orders, and modification work orders that are available through publications supply channels. The index lists the individual parts (–10, –20, –35P, etc.) and the latest changes to and revisions of each equipment publication.

Delete paragraph 2 and substitute:

2. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Use equipment forms and records in accordance with instructions in TM 38–750.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700–58 (Army), NAVSANDA Publication 378 (Navy), and AFR 71–4 (Air Force).

c. Reporting of Equipment Manual Improvements. The direct reporting, by the individual user, of errors, omissions, and recommendations for improving this manual is authorized and encouraged. DA Form 2028 (Recommended Changes to DA Technical Manual Parts List and Supply Manual 7, 8, or 9) will be used for reporting these improvement recommendations. This form will be completed in triplicate by the use of pencil, pen, or typewriter. The original and one copy will be forwarded direct to: Commanding Officer, U.S. Army Electronics Materiel Support Agency, ATTN: SELMS-MP, Fort Monmouth, N. J. 07703. One information copy will be furnished to the individual's immediate supervisor (officer, noncommissioned officer, supervisor, etc.).

Page 105. Delete paragraphs 69 and 70 and substitute:

69. Scope of Maintenance

Note. The operator performs first and second echelon maintenance. The maintenance duties assigned to the operator of the AN/ASM–63 and the compass simulator are listed below with a reference to the paragraphs covering the specific maintenance function. The duties include instructions for performing preventive maintenance and corrective maintenance and do not require tools, materials, and test equipment other than those allocated at second echelon (par. 70).

a. Daily preventive maintenance checks and services (pars. 70.2 and 70.3).
b. Cleaning (par. 70.4).
c. Monthly preventive maintenance checks and services (pars. 70.5 and 70.6).
d. Touch-up painting (par. 70.7).
e. Quarterly preventive maintenance checks and services (pars. 70.8 and 70.9).
f. Visual inspection (par. 71).
g. Repairs and replacement (par. 72).
h. Adjustments (par. 73).

70. Tools, Test Equipment, and Materials

The tools and materials required are listed below.

a. A small straight-slot screwdriver.
b. Cleaning Compound, Federal stock No. 7930–395–9542.
c. Clean, lint-free cloth.
d. Fine sandpaper, No. 0000.
e. A soft-bristled brush.

Add paragraphs 70.1 through 70.9 after paragraph 70.

70.1. Preventive Maintenance

Preventive maintenance is the systematic care,

servicing, and inspection of equipment to prevent the occurrence of trouble, to reduce downtime, and to assure that the equipment is serviceable.

a. Systematic Care. The procedures given in paragraphs 70.2 through 70.9 cover routine systematic care and cleaning essential to proper upkeep and operation of the equipment.

b. Preventive Maintenance Checks and Services. The preventive maintenance checks and services charts (pars. 70.3, 70.6, and 70.9) outline functions to be performed at specific intervals. These checks and services are to maintain Army electronic equipment in a combat serviceable condition; that is, in good general (physical) condition and in good operating condition. To assist operators in maintaining combat serviceability, the chart indicates what to check, how to check, and the normal conditions. The references column lists the paragraphs or manuals that contain detailed repair or replacement procedures. If the defect cannot be remedied by the operator, higher echelon maintenance or repair is required. Records and reports of these checks and services must be made in accordance with the requirements set forth in TM 38–750.

70.2. Daily Preventive Maintenance Checks and Services

Preventive maintenance checks and services of the AN/ASM–63 and the compass simulator are required on a daily basis. Paragraph 70.3 specifies the preventive maintenance checks and services that must be performed daily or under the special conditions listed below.

a. When the equipment is initially installed.

b. When the equipment is returned to use after higher echelon maintenance.

c. At least once each week if the test set is maintained in a *standby* condition.

70.3. Daily Preventive Maintenance Checks and Services Chart

Sequence No.	Item	Procedure	References
1	Exterior surfaces	Check to see that the exterior surfaces of the AN/ASM–63 (fig. 1) are free of dirt, dust, moisture, grease, and fungus.	Par. 70.4.
2	Controls, switches, indicators, jacks, and connectors.	*a.* Check controls, switches, indicators, jacks, and connectors for loose or insecure fastenings; tighten if required.	*a.* None.
		b. Controls and switches should operate smoothly, and knobs should be properly secured to shafts and should not bind. Tighten loose knobs and be sure that knobs do not rub against panel. Replace broken or defective knobs.	*b.* None.
		c. Check the indicators (fig. 1) for cracked or broken glass. See that indicator pointers are not bent, broken, or stuck. Refer all repairs to higher echelon.	*c.* None.
3	Operation	During operation (pars. 21–68), be alert for any evidence of unusual performance; check for burned-out lamps and fuses. Tap controls while observing meter indications for erratic actions.	None.

70.4. Cleaning

Inspect the exterior of the equipment. The external surfaces should be free of dirt, dust, grease, moisture, and fungus.

a. Remove dust, moisture, and loose dirt with a clean dry cloth.

***Warning:* Cleaning compound is flammable and its fumes are toxic. Provide adequate ventilation. *Do not* use near a flame.**

b. Remove grease, fungus, and ground-in dirt with a cloth dampened (not wet) with cleaning compound.

***Caution:* Do not press on the glass faces of the indicators (fig. 2) when cleaning; the meter may become damaged.**

c. Clean the front panel indicators and controls; use a soft clean cloth. If the dirt is difficult to remove, dampen the cloth with water; if necessary, use mild soap.

70.5. Monthly Preventive Maintenance Checks and Services

The maintenance functions indicated in the

monthly preventive maintenance checks and services chart (par. 70.6) are performed once each monthly interval in addition to the daily preventive maintenance checks and services (par. 70.3). A monthly interval is defined as approximately 30 calendar days of an 8-hour-per-day operation. Adjustment of the maintenance interval must be made to compensate for any unusual operating conditions. Equipment maintained in a *standby* (ready for immediate operation) condition must have monthly preventive maintenance performed on it. Equipment in limited storage (requires service before operation) does not require monthly preventive maintenance.

70.6. Intermediate Preventive Maintenance Checks and Services Chart

Sequence No.	Item	Procedure	References
1	Equipment	Check to see that equipment (fig. 1) is complete.	
2	Interconnecting cables and connectors.	Check all interconnecting cables and connectors (fig. 1) for cracks, breaks, cuts, kinks, deterioration, strains, and fraying. Repair simple cuts in interconnecting cables with plastic electrical tape and electrical friction tape. Replace cables that have cracked or broken connectors.	None.
3	Handles, fasteners, and front panel hardware.	Hand-check handles, fasteners, and front panel hardware for looseness. Tighten if possible, otherwise, refer to higher echelon for repairs.	None.
4	Exterior surfaces	Inspect exposed metal surfaces for rust and corrosion.	Par. 70.7.

70.7. Touch-Up Painting

Remove rust and corrosion from metal surfaces by lightly sanding them with fine sandpaper. Brush two thin coats of paint on the bare metal to protect it from further corrosion. Refer to the applicable cleaning and refinishing practices specified in TM 9–213.

70.8. Quarterly Preventive Maintenance Checks and Services

The maintenance functions indicated in the quarterly preventive maintenance checks and services chart (par. 70.9) are performed once each quarterly interval in addition to the daily and monthly preventive maintenance checks and services (pars. 70.3 and 70.6). A quarterly interval is defined as approximately 120 calendar days of 8-hour-per-day operation. All deficiencies or shortcomings will be recorded, and those not corrected during the preventive maintenance checks and services will be immediately reported to higher echelon by use of forms and procedures specified in TM 38–750. Equipment that has a deficiency that cannot be corrected at the organizational level should be deadlined in accordance with TM 38–750.

70.9. Periodic Preventive Maintenance Checks and Services Chart

Sequence No.	Item	Procedure	References
1	Equipment connectors and mating cable connectors.	Engage cable connectors to their mating equipment connectors; check for ease of engagement and snug fit. Refer all repairs for equipment connectors to higher echelon.	None.
2	Mounting	Check to see that equipment is properly secured. Replace defective mountings.	None.
3	Publications	Check to see that all publications pertinent to this equipment are on hand, complete, and usable. Check to see that all applicable Changes are on hand.	DA Pam 310–4.
4	Modification work orders (MWO's).	Check to see that all URGENT MWO's have been applied, and that all NORMAL MWO's have been scheduled. MWO stencils on the equipment are legible.	DA Pam 310–4.

Page 107. Delete figure 9.

Page 108. Delete figure 10.

Page 113. Delete appendix I and substitute:

APPENDIX
REFERENCES

Following is a list of references available to the operator and organizational maintenance repairman of Test Set, Compass System AN/ASM–63 and Simulator, Compass Transmitter SM–272/ASN:

DA Pam 310–4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (types 4, 6, 7, 8, and 9), Supply Bulletins, Lubrication Orders, and Modification Work Orders.
SB 38–100	Preservation, Packaging and Packing Materials, Supplies, and Equipment Used by the Army.
TM 9–213	Painting Instructions for Field Use.
TM 11–5131	Oscilloscopes OS–46/U, OS–46A/U, OS–5001/U, OS–5001A/U, and OS–5001B/U.
TM 11–6615–214–15	Operator's, Organizational, Field and Depot Maintenance: Navy Type MA–1 Compass (Lear).
TM 11–6625–200–12	Operator and Organizational Maintenance Manual: Multimeters ME–26A/U and ME–26B/U.
TM 38–750	The Army Equipment Record System and Procedures.

By Order of the Secretary of the Army:

EARLE G. WHEELER,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

Distribution

To be distributed in accordance with DA Form 12–31 requirements for Field Maintenance Instructions for OV–1 aircraft.

☆ U. S. GOVERNMENT PRINTING OFFICE: 1963—700506

PACKING LIST	PACKED BY	1. NO. BOXES	2a. REQUISITION NO.
	TOBYHANNA ARMY DEPOT	ONE	2b. ORDER NO.

3. END ITEM 6625-00-886-5915
TEST SET: AN/ASM-63, W/Cover
PER: BILI DECK #EHE, DTD 5178

4. DATE

5. PAGE 1 OF 1 PAGES

BOX NO. (a)	CONTENTS - STOCK NUMBER AND NOMENCLATURE (b)	UNIT OF ISSUE (c)	QUANTITIES REQUIRED		
			INITIAL OPERATION (d)	RUNNING SPARES (e)	TOTAL (f)
	C/O THE FOLLOWING:				
	5995-00-823-2676 Cable Assy CX-7565/ASM-63	ea	1	0	1
	5995-00-823-2677 Cable Assy CX-7572/ASM-63 4'	ea	1	0	1
	5995-00-823-2678 Cable Assy CX-7566/ASM-63 5'	ea	1	0	1
	5995-00-823-2679 Cable Assy CX-7567/ASM-63 5'	ea	1	0	1
	5995-00-823-2680 Cable Assy CX-7571/ASM-63 5'	ea	1	0	1
	5995-00-823-2681 Cable Assy CX-7570/ASM-63	ea	1	0	1
	5995-00-823-2682 Cable Assy CX-7562/ASM-63	ea	1	0	1
	5995-00-823-2683 Cable Assy CX-7568/ASM-63 5'	ea	1	0	1
	5995-00-823-2684 Cable Assy CX-7569/ASM-63 5'	ea	1	0	1
	5995-00-823-2689 Cable Assy CX-7563/ASM-63 3'	ea	1	0	1
	5995-00-823-2690 Cable Assy CX-7564/ASM-63 4'	ea	1	0	1
	TM11-6625-503-12 Tech Manual	ea	1	0	1
	TM11-6625-503-12,C1 Tech Manual Change 1	ea	0	1	1

6. THIS CERTIFIES THAT ITEMS LISTED HEREON ARE WITHIN THE SPECIFIED BOXES

TYPED NAME AND TITLE	SIGNATURE

DD FORM 1 SEP 70 1750

NOTES TO CONSIGNEE

The listing shown on the reverse side, together with pertinent notations relative to each item included, is furnished for your information and guidance only. In the case of lists covering equipment sets, one copy may be retained for reference and used as a supporting document to property books and the other copy retained with the equipment as a component parts listing. For the purpose of clarification, explanations of the various entries on this Packing List are furnished.

ITEM 1. The number of boxes in a set.

ITEMS 2*a.* & *b.* The requisition number appearing on the DD Form 1348-1 or order number will be indicated in this entry. The number so referenced should be cited in any correspondence regarding this shipment.

ITEM 3. The stock number, nomenclature, type number *(when available)*, and the directive under which the end item was assembled. Not applicable to shipments consisting only of miscellaneous repair parts and accessories for the assembly, set or unit in which case this entry will contain such a notation in lieu of the information cited above *(See 5.3.1.1)*.

ITEM 4. Date of preparation.

ITEM 5. Self-explanatory.

Column a. This column will be used when two or more boxes are required for the equipment. It will indicate the number of the container in which the items are packed.

Column b. This space contains a listing of items contained within the box, which are identified by stock number and nomenclature. When an FSN is not applicable, the manufacturer's code *(See 5.2.2.10)* and part number shall be used.

> *NOTE: As required, due to out of stock position within the DOD supply system, a component parts shortage which will not hinder operational functions may be waived by higher authority and will be so indicated to the right of the nomenclature. Waivers noted thereon should be requisitioned through normal supply channels.*

Column c. Self-explanatory.

Column d. "Initial Operation" - Items which are required for operation of the equipment.

Column e. "Running Spares" - Those items shipped concurrently with the equipment as spare parts and accessories.

> *NOTE: Columns d and e will be used on an optional basis.*

"Total" - Self-explanatory.

ITEM 6. Self-explanatory.

998935-01-01	P110/P2
998964-01-01	P109/P14
998940-01-01	P108/P9
998941-01-01	P107/P8
998942-01-01	P106/P7
998961-01-01	P104/P5
998946-01-01	P106/P6
998937-01-01	P531/P12
998968-01-01	P103+104/P3
998962-01-01	P101/P4
998936-01-01	P532/P13
998930-01-01	P102/P17

AN/ASM-63
LT-3310B TEST SET
MA-1 COMPASS SYSTEM

F98/u

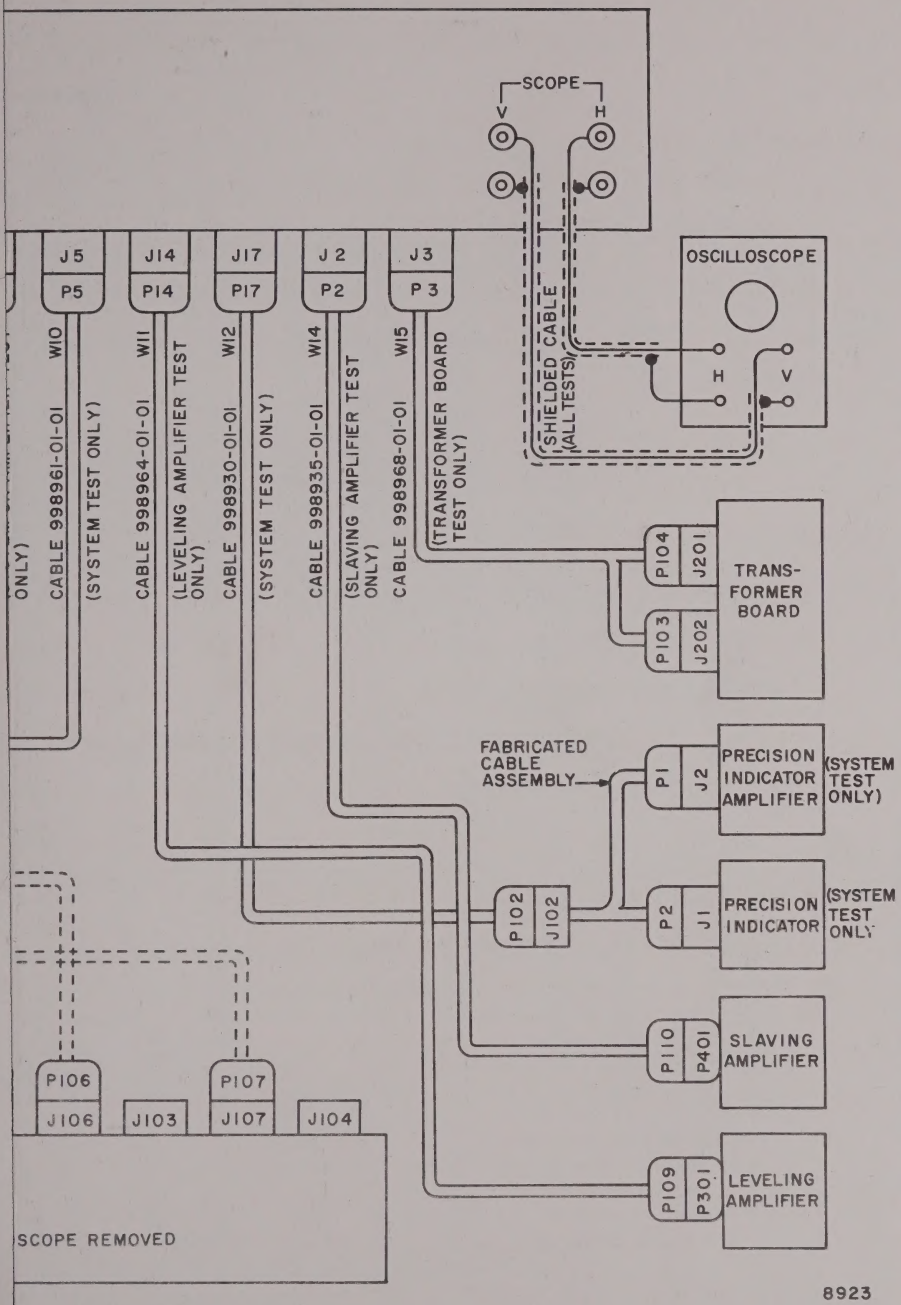


Figure 5. Test set connection diagram.

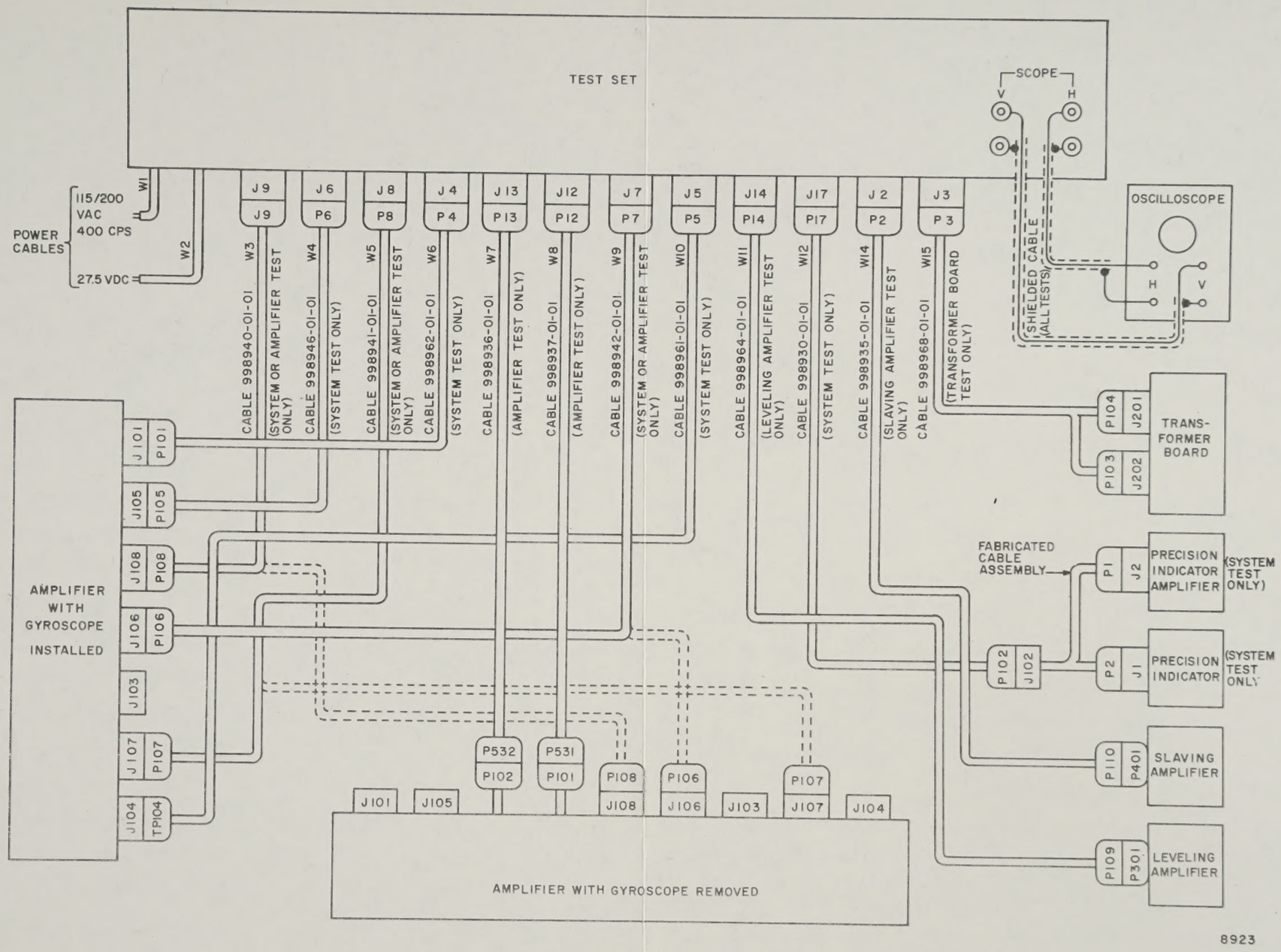


Figure 5. Test set connection diagram.

Note: The white wire is the neutral or ground wire; the red wire is the phase A wire; the green wire is the phase B wire; and the black wire is the phase C wire.

b. Install an appropriate electrical connector on the end of the cable W2 which will mate with the receptacle of the local dc power source.

Note: The white wire is the common or ground wire.

c. Connect cable W3 (connector P9) to panel assembly connector J9.

d. Connect cable W4 (connector P6) to panel assembly connector J6.

e. Connect cable W5 (connector P8) to panel assembly connector J8.

f. Connect cable W7 (connector P13) to panel assembly connector J13.

g. Connect cable W6 (connector P4) to panel assembly connector J4.

h. Connect cable W8 (connector P12) to panel assembly connector J12.

i. Connect cable W9 (connector P7) to panel assembly connector J7.

j. Connect cable W10 (connector P5) to panel assembly connector J5.

k. Connect cable W12 (connector P17) to panel assembly connector J17.

l. Connect cable W11 (connector P14) to panel assembly connector J14.

m. Connect cable W14 (connector P2) to panel assembly connector J2.

n. Connect cable W15 (connector P3) to panel assembly connector J3.

o. Coil the cables and store them in the case storage area (fig. 1).

Note: The appropriate cables will be connected to the components at the time of a particular test or tests.

17. Installation of Fuses

(fig. 6)

Be sure that the proper fuses are inserted in the fuseholders on the front panel of the test set. The following chart shows the panel identification, reference designation, ratings, and circuit for each fuse.

17. Fuses (cont)

Panel identification	Reference designation	Rating		Circuit
		Amp	Volts	
1.5 AMP	F4	1.5	250	27.5-volt dc line.
ØA 1 AMP	F1	1	250	115-volt phase A line.
ØB 1 AMP	F2	1	250	115-volt phase B line.
ØC 1 AMP	F3	1	250	115-volt phase C line.
RELAY .5 AMP	F5	0.5	250	System cutout relay.
SPARE .5 AMP		0.5	250	
SPARE 1 AMP		1	250	
SPARE 1.5 AMP		1.5	250	

18. Preoperational Testing of Equipment

After the test set has been unpacked and prepared for operation (para 10 through 17), it must be checked and calibrated by field or depot maintenance personnel. The test set should not be operated prior to satisfactory completion of these tests.

CHAPTER 3

OPERATING INSTRUCTIONS

Section I. OPERATOR'S CONTROLS AND INDICATORS

19. Test Set Controls and Indicators

(fig. 6)

The operator's controls and indicators and their functions are listed below.

Control or indicator	Function
POWER switch	Two-position toggle switch. Sw pos — Action ON — Applies ac and dc power. OFF — Removes ac and dc power.
POWER DC light	Red indicator light: Indicates application of dc power when POWER switch is at ON.
POWER Ø ROTATION DIM light	White indicator light: Indicates proper ac power phase rotation when light is dim.
POWER Ø ROTATION BRIGHT light.	White indicator light: Indicates proper ac power phase rotation when light is bright.
AC MONITOR switch	Three-position rotary switch: Connects AC VOLTS meter and AC current meter to circuit to be monitored. Sw pos — Action Ø A — Connects AC VOLTS meter to monitor phase A line-to-neutral voltage and connects AC CURRENT meter to

Control or indicator	Function	
	Sw pos	Action
		monitor phase A line current when PRESS TO READ MA switch is depressed.
	ØB	Connects AC VOLTS meter to monitor phase B line-to-neutral voltage and connects AC CURRENT meter to monitor phase B line current when PRESS TO READ MA switch is depressed.
	ØC	Connects AC VOLTS meter to monitor phase C line-to-neutral voltage and connects AC CURRENT meter to monitor phase C line current when PRESS TO READ MA switch is depressed.
FREQUENCY meter	Monitors frequency of 3-phase ac power source at phase B (line-to-neutral).	

19. Test Set Controls and Indicators (cont)

Control or indicator	Function
AC ADJUST control	Adjusts phase A, phase B, and C line-to-neutral voltages to required 115 volts.
AC VOLTS meter	Monitors 115-volt ac voltage from phase A, phase B, or phase C (line-to-neutral) as determined by position of AC MONITOR switch.
PRESS TO READ MA switch.	Momentary-open pushbutton switch. Removes short from AC CURRENT meter to read current in phase A, phase B, or phase C line as determined by position of AC MONITOR switch.
AC CURRENT meter.	Monitors current in phase A, phase B, or phase C line as determined by position of AC MONITOR switch when PRESS TO READ MA switch is depressed.
800 CPS PHASE switch	Two-position locking lever switch. Sw pos — Action 0° — Applies 800-cycle-per-second in-phase slaving signal to SLAVING SIGNAL ADJUST potentiometer.

19. Test Set Controls and Indicators (cont)

Control or indicator	Function
	Sw pos: 180° — Action: Applies 800-cycle-per-second, 180-degree out-of-phase slaving signal to SLAVING SIGNAL ADJUST potentiometer.
DC VOLTS meter	Monitors dc voltage in circuits selected by COMPONENT TEST switch and corresponding test area switches.
SLAVING SIGNAL ADJUST control.	Adjusts amount of slaving signal applied to AMPLIFIER test area circuits or SLAVING AMPLIFIER test area circuits selected by COMPONENT TEST switch and corresponding test area switches.
DC CURRENT meter	Monitors magnitude and direction of dc current flow in circuits selected by COMPONENT TEST switch and corresponding test area switches.
Electronic voltmeter sub-assembly (Electronic voltmeter).	Monitors ac signal input and output voltages in circuits determined by position of COMPONENT TEST switch and corresponding test area switches.

Control or indicator	Function
Electronic voltmeter range switch.	Ten-position rotary switch. Changes full-scale reading of electronic voltmeter to value to which switch is set (.01, .03, ±0.1, ±0.3, 1, 3, 10, 30, 100 and 300 vac).
AZIMUTH indicator	Indicates position of gyroscope azimuth and autopilot synchro transmitters with respect to flux valve simulator heading switch setting when COMPONENT TEST switch is at position 1 and SYSTEM INDICATOR switch is at AZIMUTH. Sw pos — Action Compass dial: Monitors gyroscope autopilot synchro operation when COMPONENT TEST switch is at position 1 and SYSTEM INDICATOR switch is at AZIMUTH. Pointer 1: Monitors gyroscope indicator synchro operation when COMPONENT TEST switch is at position 1.

Control or indicator	Function
	Sw pos — Action Pointer 2: Maintained at top index when COMPONENT TEST switch is at position 1.
COMPONENT TEST switch	Five-position rotary switch. Selects test set component test area and component for testing. Sw pos — Action 1 — Connects test set circuits for system tests; connects electronic voltmeter, SCOPE V binding posts, and PHASE control to SYSTEM FUNCTION switch; applies 3-phase ac power to system under test. 2 — Connects test set circuits for amplifier tests; connects electronic voltmeter and SCOPE V binding posts to AMPLIFIER TORQUER FIXED Ø, COMPASS TRANSMITTER, MONITOR LAT CONT, AMPL, and

19. Test Set Controls and Indicators (cont)

Control or indicator	Function	
	Sw pos	Action
		CUTOUT RELAY switches; connects PHASE synchro to TORQUER FIXED Ø, MONITOR LAT CONT, and AMPL switches; applies 3-phase ac power to amplifier under test.
	3	Connects test set circuits for leveling amplifier tests; connects electronic voltmeter and SCOPE V binding posts to LEVELING AMPLIFIER VTVM switch; connects PHASE control to phase B reference voltage; connects LEVELING AMPLIFIER SIGNAL ADJUST control to leveling amplifier under test; applies dc power to leveling amplifier under test.

Control or indicator	Function
	Sw pos — Action
	4 — Connects test set circuits for slaving amplifier tests; connects electronic voltmeter and SCOPE V binding posts to SLAVING AMPLIFIER FUNCTION switch; applies power to slaving amplifier under test.
	5 — Connects test set circuits for transformer board tests; connects electronic voltmeter, SCOPE V binding posts, and PHASE control to TRANSFORMER BOARD FUNCTION switch; applies 3-phase ac power to transformer board under test.
SYSTEM:	
1 light	Green indicator light: Indicates selection of test set SYSTEM test area when COMPONENT TEST switch is at position 1.

19. Test Set Controls and Indicators (cont)

Control or indicator	Function
AUTO CUTOUT light	Yellow indicator light: Indicates operation of system (controller) automatic pilot cutoff circuit when controller SET HDG. switch is at L or R.
FUNCTION switch	Four-position rotary switch. Selects system circuit to be monitored.

Sw pos	Action
1	Connects electronic voltmeter and SCOPE V binding posts to monitor gyroscope slaving torquer control phase voltage.
2	Connects electronic voltmeter and SCOPE V binding posts to monitor gyroscope leveling synchro output voltage.
3	Connects electronic voltmeter and SCOPE V binding posts to monitor gyroscope indicator synchro output; connects PHASE control to phase B reference voltage.

19. Test Set Controls and Indicators (cont)

Control or indicator	Function
	Sw pos: 4 — Action: Connects electronic voltmeter and SCOPE V binding posts to monitor gyroscope autopilot synchro output; connects PHASE synchro to phase B reference voltage.
INDICATOR switch	Two-position rotary switch: Sw pos: EXTERNAL — Action: Connects gyroscope autopilot synchro to external precision indicator to accurately monitor system and/or gyroscope operation. Sw pos: AZIMUTH — Action: Connects gyroscope autopilot synchro to AZIMUTH indicator compass dial synchro to monitor system and/or gyroscope operation.
SYNC IND switch	Three-position nonlocking lever switch.

19. Test Set Controls and Indicators (cont)

Control or indicator	Function
	Sw pos — Action L — Applies full-scale left deflection signal to controller SYNC. IND. meter when controller SLAVED-FREE switch is at SLAVED. Center — Connects controller for normal operation. R — Applies full-scale right deflection signal to controller SYNC. IND. meter when controller SLAVED-FREE switch is at SLAVED.
AMPLIFIER 2 light	Green indicator light: Indicates selection of test set AMPLIFIER test area when COMPONENT TEST switch is at position 2.
TORQUER FIXED Ø switch.	Three-position locking lever switch. Sw pos — Action LEVELING — Connects PHASE control to phase A reference voltage; connects electronic voltmeter and SCOPE V

19. Test Set Controls and Indicators (cont)

Control or indicator	Function	
	Sw pos	Action
		binding posts to monitor amplifier leveling torquer fixed phase voltage.
	Center	Disconnects PHASE control from reference voltage; disconnects electronic voltmeter and SCOPE V binding posts from monitored circuit.
	SLAVING	Connects PHASE control to phase B reference voltage; connects electronic voltmeter and SCOPE V binding posts to monitor amplifier slaving torquer fixed phase voltage.
COMPASS TRANSMITTER switch.	Three-position locking lever switch.	
	Sw pos	Action
	EXCITATION	Connects electronic voltmeter and SCOPE V binding posts to monitor amplifier flux valve excitation voltage.

19. Test Set Controls and Indicators (cont)

Control or indicator	Function
	Sw pos — Action
	Center — Disconnects electronic voltmeter and SCOPE V binding posts from monitored circuit.
	LAT COMP FIXED PHASE — Connects electronic voltmeter and SCOPE B binding posts to monitor amplifier latitude compensation fixed phase voltage.
MONITOR LAT CONT switch.	Three-position locking lever switch.
	Sw pos — Action
	R101 — Connects PHASE control to amplifier latitude compensation fixed phase voltage; connects electronic voltmeter and SCOPE V binding posts to monitor amplifier latitude compensation potentiometer voltage.
	Center — Disconnects PHASE control from reference voltage; disconnects electronic

19. Test Set Controls and Indicators (cont)

Control or indicator	Function
	Sw pos — Action voltmeter and SCOPE V binding posts from monitored circuit. R103 — Connects electronic voltmeter and SCOPE V binding posts to monitor amplifier latitude compensation circuit balance.
AMPL switch	Three-position locking level switch. Sw pos — Action OUTPUT — Connects PHASE control to phase A reference voltage; connects electronic voltmeter and SCOPE V binding posts to monitor amplifier slaving amplifier output. INPUT — Disconnects PHASE control from reference voltage; disconnects electronic voltmeter and SCOPE V binding posts from monitored circuit.

19. Test Set Controls and Indicators (cont)

Control or indicator	Function	
	Sw pos	Action
	SHUNTED	Connects electronic voltmeter
	INPUT	and SCOPE V binding posts to monitor slaving input signal from SLAVING SIGNAL ADJUST control.
CUTOUT RELAY switch	Two-position nonlocking lever switch.	
	Sw pos	Action
	ON	Applies 28 volts dc to amplifier transformer board cutout relay removing amplifier gyroscope slaving torquer and leveling torquer fixed phase voltages; connects electronic voltmeter and SCOPE V binding posts to monitor amplifier gyroscope leveling torquer fixed phase voltage.
	OFF	Removes 28 volts dc from amplifier transformer board cutout relay; disconnects electronic voltmeter and SCOPE V binding posts from monitored circuit.

19. Test Set Controls and Indicators (cont)

Control or indicator	Function
LEVELING AMPLIFIER:	
3 light	Green indicator light: Indicates selection of test set LEVELING AMPLIFIER test area when COMPONENT TEST switch is at position 3.
SIGNAL switch	Three-position locking lever switch. Sw pos — Action ZERO — Grounds input to leveling amplifier under test. ØB — Applies phase B signal to SIGNAL ADJUST control. ØB + 180° — Applies phase B + 180° signal to SIGNAL ADJUST control.
SIGNAL ADJUST control.	Adjusts amount of signal applied to leveling amplifier under test when SIGNAL switch is at ØB, or ØB + 180°.
VTVM switch	Two-position nonlocking lever switch. Sw pos — Action INPUT — Connects electronic voltmeter and SCOPE V binding posts to monitor input signal applied to leveling amplifier under test.

19. Test Set Controls and Indicators (cont)

Control or indicator	Function
	Sw pos: OUTPUT — Action: Connects electronic voltmeter and SCOPE V binding posts to output of leveling amplifier under test.
SLAVING AMPLIFIER:	
4 light	Green indicator light: Indicates selection of test set SLAVING AMPLIFIER test area when COMPONENT TEST switch is at position 4.
FUNCTION switch	Two-position rotary switch.
	Sw pos: 1 — Action: Disconnects signal input from slaving amplifier under test; connects DC CURRENT meter to monitor output of slaving amplifier under test.
	Sw pos: 2 — Action: Connects SLAVING SIGNAL ADJUST control to slaving amplifier under test; connects electronic voltmeter subassembly and SCOPE V binding posts to monitor

19. Test Set Controls and Indicators (cont)

Control or indicator	Function
	Sw pos: — Action: input signal applied to slaving amplifier under test; connects DC CURRENT meter to monitor output of slaving amplifier under test; connects shunt to multiply DC CURRENT meter full-scale range by 10.
MONITOR SLAVING switch.	Three-position locking lever switch.
	Sw pos: SUPPLY 1 — Action: Connects DC VOLTS meter to monitor dc voltage derived from full-wave rectified 400-cps phase AC voltage and applied to slaving amplifier under test.
	Sw pos: SUPPLY 2 — Action: Connects DC VOLTS meter to monitor dc voltage derived from full-wave rectified 400-cps phase B voltage and applied to slaving amplifier under test.

19. Test Set Controls and Indicators (cont)

Control or indicator	Function
	Sw pos: OUTPUT — Action: Connects DC VOLTS meter to monitor dc voltage from slaving amplifier under test.
TRANSFORMER BOARD:	
5 light	Green indicator light: Indicates selection of test set TRANSFORMER BOARD test area when COMPONENT TEST switch is at position 5.
FUNCTION switch	Twelve-position rotary switch.
	Sw pos: 1 — Action: Connects electronic voltmeter and SCOPE V binding posts to monitor flux valve excitation voltage from transformer board under test; grounds input to magnetic amplifier of transformer board under test.
	Sw pos: 2 — Action: Connects electronic voltmeter and SCOPE V binding posts to monitor latitude compensation fixed phase voltage from transformer

19. Test Set Controls and Indicators (cont)

Control or indicator	Function	
	Sw pos	Action
		board under test; grounds input to magnetic amplifier of transformer board under test.
	3	Connects electronic voltmeter and SCOPE V binding posts to monitor latitude compensation control phase voltage from transformer board under test; grounds input to magnetic amplifier of transformer board under test; connects PHASE control to latitude compensation fixed phase voltage from transformer board under test.
	4	Connects electronic voltmeter and SCOPE V binding posts to monitor leveling torquer fixed phase voltage from transformer board under test; grounds input to magnetic amplifier of trans-

19. Test Set Controls and Indicators (cont)

Control or indicator	Function	
	Sw pos	Action
		former board under test; connects PHASE control to phase AC (ØB + 180°) reference voltage.
	5	Connects electronic voltmeter and SCOPE V binding posts to monitor leveling torquer fixed phase voltage from transformer board under test; grounds input to magnetic amplifier of transformer board under test; applies 28 volts dc to cutout relay of transformer board under test.
	6	Connects electronic voltmeter and SCOPE V binding posts to monitor slaving torquer fixed phase voltage from transformer board under test; grounds input to magnetic amplifier of transformer board under test; connects PHASE control to

19. Test Set Controls and Indicators (cont)

Control or indicator	Function	
	Sw pos	Action
		phase B reference voltage.
	7	Connects electronic voltmeter and SCOPE V binding posts to monitor magnetic amplifier reference voltage; grounds input to magnetic amplifier of transformer board under test.
	8	Connects electronic voltmeter and SCOPE V binding posts to monitor slaving torquer control phase voltage from transformer board under test; connects MIN OUTPUT ADJUST potentiometer and DC CURRENT meter to input of magnetic amplifier on transformer board under test; connects PHASE control to phase AC reference voltage. Connects DC CURRENT meter for minimum adjustment of MIN OUTPUT ADJUST control

19. Test Set Controls and Indicators (cont)

Control or indicator	Function	
	Sw pos	Action
		when NULL switch is open
	9	Connects electronic voltmeter and SCOPE V binding posts to monitor slaving torquer control phase voltage from transformer board under test; connects DC ADJUST potentiometer and DC CURRENT meter to adjust and monitor positive dc input signal applied to magnetic amplifier on transformer board under test; connects PHASE control to phase AC reference voltage.
	10	Connects electronic voltmeter and SCOPE V binding posts to monitor slaving torquer control phase voltage from transformer board under test; connects DC ADJUST potentiometer and DC CURRENT meter to adjust and monitor negative dc

Control or indicator	Function	
	Sw pos	Action
		input signal applied to magnetic amplifier on transformer board under test; connects PHASE control to phase AC reference voltage.
	11	Connects electronic voltmeter and SCOPE V binding posts to monitor slaving torquer control phase voltage from transformer board under test; connects DC ADJUST potentiometer and DC CURRENT meter to adjust and monitor positive dc input signal applied to magnetic amplifier on transformer board under test; connects PHASE control to phase AC reference voltage.

19. Test Set Controls and Indicators (cont)

Control or indicator	Function
	Sw pos: 12 — Action: Connects electronic voltmeter and SCOPE V binding posts to monitor slaving torquer control phase voltage from transformer board under test; connects DC ADJUST potentiometer and DC CURRENT meter to adjust and monitor negative dc input signal applied to magnetic amplifier on transformer board under test; connects PHASE control to phase AC reference voltage.
3303A 3303B switch	Four-position rotary switch.
	Sw pos: 3303A — Action: Connects test set transformer board test area for testing of transformer board 110348-01 when FUNCTION switch is at position 2 or position 3.

19. Test Set Controls and Indicators (cont)

Control or indicator	Function
	Sw pos: 3303B 1, 2 and 3 — Action: Connects test set transformer board test area for testing of transformer board 126094-01 or 126094-02 when FUNCTION switch is at position 2 or 3.
DC ADJUST control.	Adjusts magnitude or dc input signal applied to magnetic amplifier on transformer board under test when FUNCTION switch is at position 9, 10, 11, or 12.
NULL switch	Momentary-open pushbutton switch. Removes shunt from DC CURRENT meter to obtain accurate minimum output indication when FUNCTION switch is at position 8.
MIN OUTPUT ADJUST control.	Adjusts magnitude of dc input signal applied to magnetic amplifier on transformer board under test to obtain minimum output when FUNCTION switch is at position 8.
DISCRIMINATOR REFERENCE switch.	Three-position nonlocking lever switch.

19. Test Set Controls and Indicators (cont)

Control or indicator	Function	
	Sw pos	Action
	ØB	Connects DC VOLTS meter to monitor dc voltage derived from full-wave rectified 400-cps phase B voltage obtained from transformer board under test.
	Center	Disconnects DC VOLTS meter from monitored circuit.
	ØA	Connects DC VOLTS meter to monitor dc voltage derived from full-wave rectified 400-cps phase AC voltage obtained from transformer board under test.
SCOPE V binding posts.	Used to connect an oscilloscope vertical input to circuits selected by COMPONENT TEST switch and appropriate test set test area switches to monitor signals and phasing.	
SCOPE H binding posts.	Used to connect an oscilloscope horizontal input to output of PHASE control to monitor phasing and phase shift in circuits selected by COMPONENT TEST switch and appropriate test area switches.	

19. Test Set Controls and Indicators (cont)

Control or indicator	Function
PHASE control	Used to shift phase of reference voltage through 360° to monitor phasing and phase shift in circuits selected by COMPONENT TEST switch and appropriate test set test area switches.
Flux valve simulator heading switch.	Twelve-position rotary switch. Selects simulated flux valve signal which corresponds to indicated magnetic heading (calibrated from 0° to 360° in 30° increments).

20. Controller Controls and Indicators (fig. 7)

Control or indicator	Function
SYNC. IND. meter	Zero-center microammeter: Provides visual indication of relationship between gyroscope reference position and required magnetically slaved position when SLAVED-FREE switch is at SLAVED.
SET HDG. switch	Three-position spring-loaded rotary switch: Provides fast slaving (sluing) for correction of off-reference condition of gyroscope.

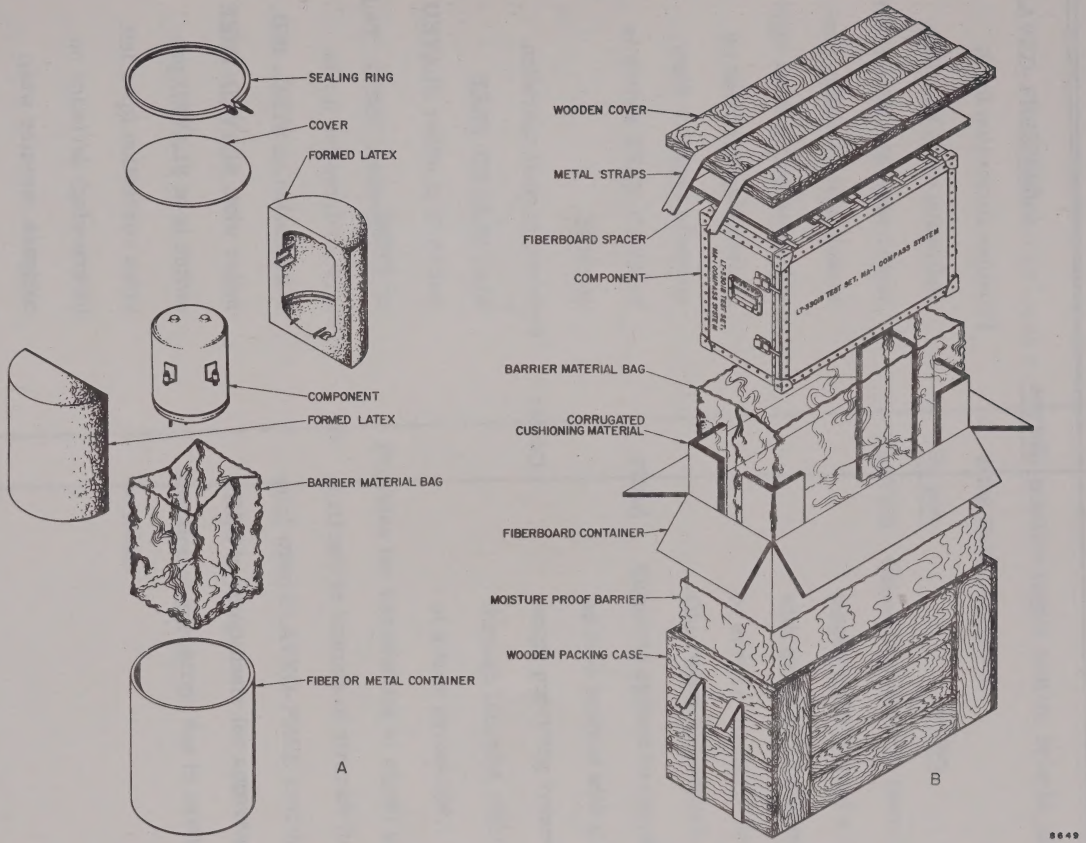


Figure 6. Test Set, operating controls and indicators.

Control or indicator	Function	
	Sw pos	Action
	L	Provides correction for R indication on SYNC. IND. meter when SLAVED-FREE switch is at SLAVED; provides correction for a right (increasing) deviation on compass repeater when SLAVED-FREE switch is at FREE.
	Center	Provides normal operation when SLAVED-FREE switch is at either SLAVED or FREE.
	R	Provides correction for an L indication on SYNC. IND. meter when SLAVED-FREE switch is at SLAVED; provides correction for a left (decreasing) deviation on compass repeater when SLAVED-FREE switch is at FREE.

20. Controller Controls and Indicators (cont)

Control or indicator	Function
SLAVED-FREE switch	Two-position toggle switch: Selects operating mode of system. Sw pos — Action SLAVED — Connects system to operate as magnetically slaved system with gyroscope referenced to earth's magnetic field (flux valve simulator). FREE — Connects system to operate as free system with gyroscope providing reference through inherent stability of a free gyroscope.
LAT. CONT. control	Provides for introduction of signal proportional to latitude of aircraft (test site) when SLAVED-FREE switch is at FREE to compensate for apparent precession of gyroscope due to earth's rotation.

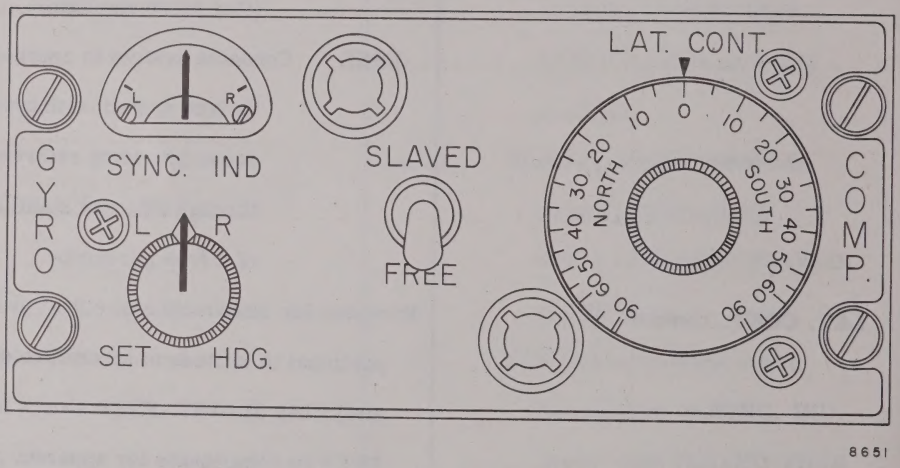


Figure 7. Controller, operating controls and indicators.

Section II. PRELIMINARY STARTING PROCEDURES

Caution: Before performing the system, component, or subassembly tests, carefully read the procedures pertaining to the items being tested to prevent possible damage to the equipment.

21. Preliminary Procedures

a. Remove the cover from the case.

b. Check that the cables have been connected to the panel assembly as instructed in paragraph 16.

c. The chart below lists the initial settings for the test set and controller controls and switches (fig. 6 and 7).

Caution: Always return each switch or control to its initial setting upon completion of each test, unless instructed otherwise, to prevent possible damage to the test set or the items being tested.

Switch or control	Initial position
POWER switch	OFF
AC MONITOR switch	ØA
AC ADJUST control	Maximum counterclockwise
800 CPS PHASE switch	0°
SLAVING SIGNAL ADJUST control	Maximum counterclockwise
Range switch (electronic voltmeter)	300
COMPONENT TEST switch	1
SYSTEM FUNCTION switch	1
SYSTEM INDICATOR switch	AZIMUTH
SYSTEM SYNC IND switch	Center
AMPLIFIER TORQUER FIXED Ø switch	Center
AMPLIFIER COMPASS TRANSMITTER switch	Center
AMPLIFIER MONITOR LAT CONT switch	Center

21c (cont)

Switch or control	Initial position
AMPLIFIER AMPL switch	INPUT
AMPLIFIER CUTOUT RELAY switch	OFF
LEVELING AMPLIFIER SIGNAL switch	ØB
LEVELING AMPLIFIER VTVM switch	OUTPUT
LEVELING AMPLIFIER SIGNAL ADJUST control	Maximum counterclockwise
SLAVING AMPLIFIER FUNCTION switch	1
SLAVING AMPLIFIER MONITOR SLAVING switch	SUPPLY 2
TRANSFORMER BOARD FUNCTION switch	1
TRANSFORMER BOARD 3303A 3303B switch	3303A
TRANSFORMER BOARD DC ADJUST control	Maximum counterclockwise
TRANSFORMER BOARD MIN OUTPUT ADJUST control	Maximum counterclockwise
TRANSFORMER BOARD DISCRIMINATOR REFERENCE switch	Center
PHASE control	0
Flux valve simulator heading switch	0

d. Connect the oscilloscope vertical and horizontal input terminals to the test set SCOPE V and H binding posts, respectively. Use shielded leads.

e. Connect the precision indicator, precision indicator amplifier, and fabricated cable assembly (para 9b (8)) to cable W12 (connector P102).

f. Connect cable W2 to a 27.5-volt dc power source.

g. Connect cable W1 to a 115-volt line-to-neutral (200-volt line-to-line) 3-phase, 400-cycle, ac power source.

22. Power Distribution Tests

a. Apply power to the oscilloscope.

b. Place the POWER switch to the ON position. The red POWER DC light and green SYSTEM 1 light should light; the DC VOLTS meter should indicate 27.5 ± .5 volts.

c. Rotate the AC ADJUST control in the clockwise direction until the AC VOLTS meter indicates 115 volts. The FREQUENCY meter should indicate 400 ±5 cycles; the POWER Ø ROTATION BRIGHT light should light brightly; the POWER Ø ROTATION DIM light should glow dimly.

Note: If the POWER Ø ROTATION BRIGHT light is dim and the POWER Ø ROTATION DIM light is bright, the phase sequence of the ac power applied to the test set is incorrect.

d. Place the AC MONITOR switch to the ØB position, then the ØC position. The AC VOLTS meter should indicate 115 volts ±1.2 for each position of the AC MONITOR switch. Return the AC MONITOR switch to the ØA position.

e. Rotate the AC ADJUST control maximum counterclockwise and place the POWER switch to the OFF position.

Section III. OPERATING PROCEDURES, 5005A COMPASS SYSTEM TESTS

Note: The procedures of paragraphs 23 through 35 are to be used in the initial tests and adjustments of the amplifier-gyroscope assembly and controller issued with the test set as well as for testing and adjusting these equipments for field service.

23. Test Connections

(fig. 5)

Note: The compass system 5005A consists of a controller, gyroscope, and amplifier model 3303A.

a. Perform the applicable procedures of paragraph 21.

b. Connect cable W6 (fig. 5) (connector P101) to amplifier connector J101.

c. Connect cable W10 (connector TP104) to amplifier connector J104.

d. Connect cable W4 (connector P105) to amplifier connector J105.

e. Connect cable W9 (connector P106) to amplifier connector J106.

f. Connect cable W5 (connector P107) to amplifier connector J107.

g. Connect cable W3 (connector P108) to amplifier connector J108.

24. Starting Procedures

a. Apply power to the oscilloscope.

b. Place the COMPONENT TEST switch (fig. 6) to position 1.

c. Place the POWER switch to the ON position and rotate the AC ADJUST control in the clockwise direction until the AC VOLTS meter indicates 115 volts. The red POWER DC light, the green SYSTEM 1 light, and the yellow SYSTEM AUTO CUTOUT light should light; the DC VOLTS meter should indicate 27.5 ±.5 volts.

Caution: Place all switches and controls to their initial positions (chart, para 21c) unless instructed otherwise, and return any operated switches or controls to the initial positions upon completion of the test.

25. Gyroscope Power Consumption Test

a. Remove fuses F101 and F103 (fig. 4) from the fuseholders on the amplifier chassis.

Note: Removal of fuses F101 and F103 removes three-phase power from all components except the gyroscope providing a means of measuring the gyroscope input current.

b. Allow the gyroscope to operate a minimum of 10 minutes with fuses F101 and F103 removed before performing (c) through (h) below.

c. Place the AC MONITOR switch (fig. 6) to the ØA position. The AC VOLTS meter should indicate 115 volts ±1.2.

d. Momentarily press the PRESS TO READ MA switch. The AC CURRENT meter indication should not exceed 100 milliamperes. Record the value.

e. Place the AC MONITOR switch to the ØB position. The AC VOLTS meter should indicate 115 ±1.2 volts.

f. Momentarily press the PRESS TO READ MA switch. The AC CURRENT meter indication should not exceed 110 milliamperes. Record the value.

g. Place the AC MONITOR switch to the ØC position. The AC VOLTS meter should indicate 115 volts ±1.2.

h. Momentarily press the PRESS TO READ MA switch. The AC CURRENT meter indication should not exceed 100 milliamperes. Record the value.

i. Return the AC MONITOR switch to the ØA position.

j. Compare the current values of (d) and (h) above. The two current values should not differ more than 20 milliamperes.

k. Compare the current value of (f) above with the current values of (d) and (h) above. The current value of (f) should be greater than the current value of either (d) or (h) and should not exceed the smaller current value more than 30 milli-amperes.

1. Place the POWER switch to the OFF position and replace fuses F101 and F103 in their respective fuseholders on the amplifier chassis.

26. Latitude Compensation Circuit Adjustment

Note: The procedures of (a) through (q) below must be performed before proceeding with the system checks or before using an amplifier-gyroscope assembly as a standard.

a. Remove fuse F101 from the fuseholder on the chassis and temporarily replace it with a 1.6-ampere fuse.

Caution: Use a 1.6-ampere fuse in place of fuse F101 only while performing the latitude compensation circuit adjustments of c through o below. Upon completion of the latitude compensation circuit adjustment, the 1.6-ampere fuse must be removed and the original 0.1 ampere fuse installed in the F101 fuseholder on the chassis.

b. Remove the eight screws and lockwashers securing the dust cover to the chassis and remove the dust cover (fig. 4).

c. Loosen the locknuts on latitude compensation potentiometer R101 and balance potentiometer R103 located at the left rear corner of the gyroscope shock mount.

d. Set latitude compensation potentiometer R101 at its extreme clockwise position; set balance potentiometer R103 at its approximate center of travel.

e. Place the SLAVED-FREE switch (fig. 6) to the FREE position.

f. Note the voltages, stamped on the top of the gyroscope, required for the 90° north and the 90° south conditions. Add the two voltages and record the sum.

g. Rotate the LAT. CONT. control precisely to the 90 NORTH position. Record the indication obtained on the electronic voltmeter.

h. Rotate the LAT. CONT. control precisely to the 90 SOUTH position. Record the indication obtained on the electronic voltmeter.

i. Add the two voltages recorded in g and h above and record the sum.

j. Adjust latitude compensation potentiometer R101 in the counterclockwise direction, as necessary, and repeat g, h, and i above until the sum of the voltages at the 90 NORTH position and the 90 SOUTH position of the controller LAT. CONT. control is equal to the sum of the voltages stenciled on the top of the gyroscope (f above). Lock latitude compensation potentiometer R101 at this setting.

k. Rotate the LAT. CONT. control precisely to the 90 NORTH position.

l. Adjust balance potentiometer R103 until the electronic voltmeter indicates the voltage stenciled on the top of the gyroscope for the 90° North condition. Lock balance potentiometer R103 at this setting.

m. Rotate the LAT. CONT. control precisely to the 90 SOUTH position. The electronic voltmeter should indicate the voltage stenciled on the top of the gyroscope for the 90° South condition.

n. Check the electronic voltmeter indication with the LAT. CONT. control precisely at the 90 NORTH position and precisely at the 90 SOUTH position. The indications should be the values stenciled on top of the gyroscope for the 90° North and 90° South conditions, respectively.

o. Repeat c through n above, if necessary, until the voltages at the 90 NORTH position and the 90 SOUTH position of the LAT. CONT. control are the same as the voltages stenciled on the top of the gyroscope.

p. Remove the 1.6-ampere fuse installed in the F101 fuseholder on the chassis (a above). Install the original 0.1-ampere fuse in the F101 fuseholder.

Caution: Failure to remove the 1.6-ampere fuse and replace it with the original 0.1 ampere fuse may result in damage to the test set and/or the system under test.

q. Replace the dust cover on the chassis and secure with eight screws and lockwashers.

27. SYNC. IND. Meter Test

a. Place the SLAVED-FREE switch to the SLAVED position.

b. Hold the SYNC IND switch to the R direction. The SYNC. IND. meter should deflect to the right and indicate full scale within 5 percent.

c. Release the SYNC IND switch. The SYNC. IND. meter should return to the center.

d. Hold the SYNC IND switch to the L direction. The SYNC. IND. meter should deflect to the left and indicate full scale within 5 percent.

e. Release the SYNC IND switch. The SYNC. IND. meter should return to the center.

28. Leveling Rate Test

a. Place the SYSTEM FUNCTION switch to position 2.

b. Place the SLAVED-FREE switch to the FREE position.

c. Place the amplifier-gyroscope assembly on the tilt table so that, when facing the connectors, the amplifier-gyroscope assembly may be tilted clockwise and counterclockwise from level. Secure the amplifier-gyroscope assembly to the tilt table.

d. Place the amplifier and tilt table on the vibration table so that the amplifier connectors are to the east.

e. Hold the SET HDG. switch to the L or R position, as necessary, until the AZIMUTH indicator compass dial indicates 0° with respect to pointer 2.

Note: The yellow SYSTEM AUTO CUTOUT light should go out when the SET HDG. switch is rotated to the L or R position.

f. Apply vibration of 0.002 to 0.005 inch double amplitude at 1,500 to 2,000 cycles per minute to the vibration table.

g. Check the electronic voltmeter indication. The electronic voltmeter indication should not exceed 0.120 volt.

h. Tilt the amplifier-gyroscope assembly approximately 10° in the clockwise direction and lock it at this position. The electronic voltmeter reading should exceed 1.52 volts.

i. Observe the electronic voltmeter and note the time required for the indication to decrease from 1.52 volts to 0.95 volt. The time required for the voltage to change from 1.52 volts to 0.95 volt should be between 30 and 90 seconds.

j. Return the amplifier-gyroscope assembly to level and wait until the electronic voltmeter indication stops changing. The minimum indication should not exceed 0.120 volt.

k. Tilt the amplifier-gyroscope assembly approximately 10° in the counterclockwise direction and lock it at this position. The electronic voltmeter reading should exceed 1.52 volts.

l. Observe the electronic voltmeter and note the time required for the indication to decrease from 1.52 volts to 0.95 volt. The time required for the voltage to change from 1.52 volts to 0.95 volt should be between 30 and 90 seconds.

m. Return the amplifier-gyroscope assembly to level and wait until electronic voltmeter indication stops changing. The minimum indication should not exceed 0.120 volt.

n. Stop the vibration table and remove the amplifier-gyroscope assembly and tilt table. Remove the amplifier-gyroscope assembly from the tilt table.

29. Sluing (Fast-Slaving) Rate Test

a. Position the amplifier-gyroscope assembly with the connectors to the east.

b. Place the SYSTEM FUNCTION switch to position 3.

c. Place SLAVED-FREE switch to the FREE position.

d. Hold the SET HDG. switch to the L or R position, as necessary, until the AZIMUTH indicator compass dial indicates 0° with respect to pointer 2.

Note: The yellow SYSTEM AUTO CUTOUT light should be out when the SET HDG. switch is at the L or R position.

e. Simultaneously start a stopwatch and rotate the SET HDG. switch to the L position.

f. Stop the stopwatch and release the SET HDG. switch when the AZIMUTH indicator compass dial indicates 180° with respect to pointer 2. AZIMUTH indicator pointer 1 should have moved in the counterclockwise direction and the time required for the 180° travel should be 15 seconds ±5.

g. Hold the SET HDG. switch to the L or R position, as necessary, until the AZIMUTH indicator compass dial indicates 180° with respect to pointer 2.

h. Simultaneously start a stopwatch and rotate the SET HDG. switch to the R position.

i. Stop the stopwatch and release the SET HDG. switch when the AZIMUTH indicator compass dial indicates 0° with respect to pointer 2. The AZIMUTH indicator pointer 1 should have moved in the clockwise direction and the time required for the 180° travel should be 15 seconds ±5.

30. Slaving Rate Test, Compass System (5005A)

a. Place the SYSTEM FUNCTION switch to position 3 and the flux valve simulator heading switch to the 0 position.

b. Place the SLAVED-FREE switch to the SLAVED position.

c. Level the vibration table. Place the amplifier-gyroscope assembly on the vibration table. Check to see that the vibration table remains level.

d. Apply vibration of 0.002 to 0.005 inch double amplitude at 1,500 to 2,000 cycles per minute to the vibration table.

e. Rotate the amplifier-gyroscope assembly in the clockwise direction until the AZIMUTH indicator compass dial indicates 90° with respect to pointer 2, and immediately start a stopwatch.

f. Observe the AZIMUTH indicator compass dial. When the compass dial indicates 80° with respect to pointer 2, stop the stopwatch and record the time. The time required for the compass dial to move from the 90° to the 80° indication should be between 5 minutes and 20 minutes.

g. Rotate the amplifier-gyroscope assembly in the counterclockwise direction until the AZIMUTH indicator compass dial indicates 270° with respect to pointer 2, and immediately start a stopwatch.

h. Observe the AZIMUTH indicator compass dial. When the compass dial indicates 280° with respect to pointer 2, stop the stopwatch and record the time. The time required for the compass dial to move from the 270° to the 280° indication should be between 5 minutes 15 seconds, and 18 minutes 30 seconds.

i. Hold the SET HDG. switch to the L or R position, as necessary, until the AZIMUTH indicator compass dial indicates 0° with respect to pointer 2.

j. Stop the vibration table.

k. Remove the amplifier-gyroscope assembly from the vibration table.

31. Slaving Accuracy Test

a. Level the vibration table. Place the amplifier-gyroscope assembly on the vibration table. Check to see that the vibration table remains level.

b. Apply vibration of 0.002 to 0.005-inch double amplitude at 1,500 to 2,000 cycles per minute to the vibration table.

c. Place the SYSTEM FUNCTION switch to position 3, the SYSTEM INDICATOR switch to the EXTERNAL position, and the flux valve simulator heading switch to position 30.

d. Place the SLAVED-FREE switch to the SLAVED position.

e. Rotate the amplifier-gyroscope assembly in the clockwise direction until the precision indicator indicates 5° clockwise from the flux valve simulator heading.

f. Allow the gyroscope to slave until there is no further movement of the precision indicator. Record the precision indicator reading.

g. Rotate the amplifier-gyroscope assembly in the counterclockwise direction until the precision indicator indicates 5° counterclockwise from flux valve simulator heading.

h. Allow the gyroscope to slave until there is no further movement of the precision indicator. Record the precision indicator reading.

i. Compare the readings recorded in (f) and (h) above. The difference between the readings should not exceed 25'. The average of the readings should not be more than 2° off the flux valve simulator heading.

j. Place the flux valve simulator heading switch to position 120 and repeat steps c through i, above.

k. Compare the readings obtained. The difference between the readings should not exceed 25'. The average of the readings should not be more than 2° off the flux valve simulator heading.

l. Place the flux valve simulator heading switch to position 210 and repeat steps c through i, above.

m. Compare the readings obtained. The difference between the readings should not exceed 25'. The average of the readings should be 210° ±2°.

n. Place the test set flux valve simulator heading switch to position 300 and repeat steps c through i above.

o. Compare the readings obtained. The difference between the readings should not exceed 25'. The average of the readings should be not more than 2° off the flux valve simulator heading.

p. Place the flux valve simulator heading switch to position 0.

q. Rotate the amplifier in the clockwise direction until the precision indicator indicates 2.50°.

r. Allow the gyroscope to slave until there is no further movement of the precision indicator. Record the precision indicator reading.

s. Rotate the amplifier in the counterclockwise direction until the precision indicator indicates 357.50°.

t. Allow the gyroscope to slave until there is no further movement of the precision indicator. Record the precision indicator reading.

u. Compare the readings recorded in r and t above. The readings should be 0° ±2°.

v. Stop the vibration table.

32. Free Drift-Vibration Test

Note: The latitude compensation circuit adjustment of paragraph 26 above must be performed before conducting the free drift test.

a. Place the SYSTEM FUNCTION switch to position 3 or 4, the SYSTEM INDICATOR switch to the EXTERNAL position, and the flux valve simulator heading switch to the 0° position.

b. Place the SLAVED-FREE switch to the SLAVED position.

c. Place the amplifier on the vibration table. Rotate the amplifier-gyroscope assembly as necessary, until the precision indicator indicates approximately 0°.

d. Apply vibration of 0.002 to 0.005-inch double amplitude at 1,500 to 2,000 cycles per minute.

e. Place the SLAVED-FREE switch to the FREE position and rotate the LAT. CONT. control to the 90 NORTH position. Record the precision indicator reading.

f. Allow the system to operate for 15 minutes and record the precision indicator reading.

Note: Counterclockwise change of the precision indicator reading is negative; clockwise change of the precision indicator reading is positive. If the original reading is 1.5° clockwise from 0° and the final reading is 0.5° counterclockwise from 0°, the total change is considered to be -2.0°. Make careful note of the sign as well as the amount of change.

g. Rotate the amplifier-gyroscope assembly clockwise until the precision indicator indicates approximately 90°, and rotate the LAT. CONT. control to the 90 SOUTH position. Record the precision indicator reading.

h. Allow the system to operate for 15 minutes and record the precision indicator reading.

i. Rotate the amplifier-gyroscope assembly in the clockwise direction until the precision indicator indicates approximately 180°, and rotate the LAT. CONT. control to the 0 position. Record the precision indicator reading.

j. Allow the system to operate for 15 minutes and record the precision indicator reading.

k. Rotate the amplifier-gyroscope assembly in the clockwise direction until the precision indicator indicates approximately 270°, and rotate the LAT. CONT. control to the latitude of the test area. Record the precision indicator reading.

l. Allow the system to operate for 15 minutes and record the precision indicator reading.

m. Stop the vibration table and remove the amplifier.

n. Compare the precision indicator readings recorded at the start and finish of each 15-minute interval and determine the total change or actual drift for each 15-minute interval.

o. Multiply each actual drift determined in n above by 4 to obtain the actual drift per hour. Record the actual drift per hour for each position of the amplifier-gyroscope assembly.

p. Determine the calculated drift per hour for each amplifier position by performing steps a through d of paragraph 33. Record the calculated drift per hour determined for each position of the amplifier-gyroscope assembly.

33. Determination of Calculated Drift per Hour

(fig. 8)

a. On the graph of figure 8, locate the latitude of the test site and draw a horizontal line through the graph parallel to the 0° latitude line.

b. Follow the horizontal 0° latitude line and locate the curve which corresponds to the LAT. CONT. control position or setting.

Note: In the case of the latitude of the test site, it will probably be necessary to interpolate between two curves.

c. Follow the curve selected in b, above until it intersects the horizontal line drawn at the latitude of the test site. Mark this intersection.

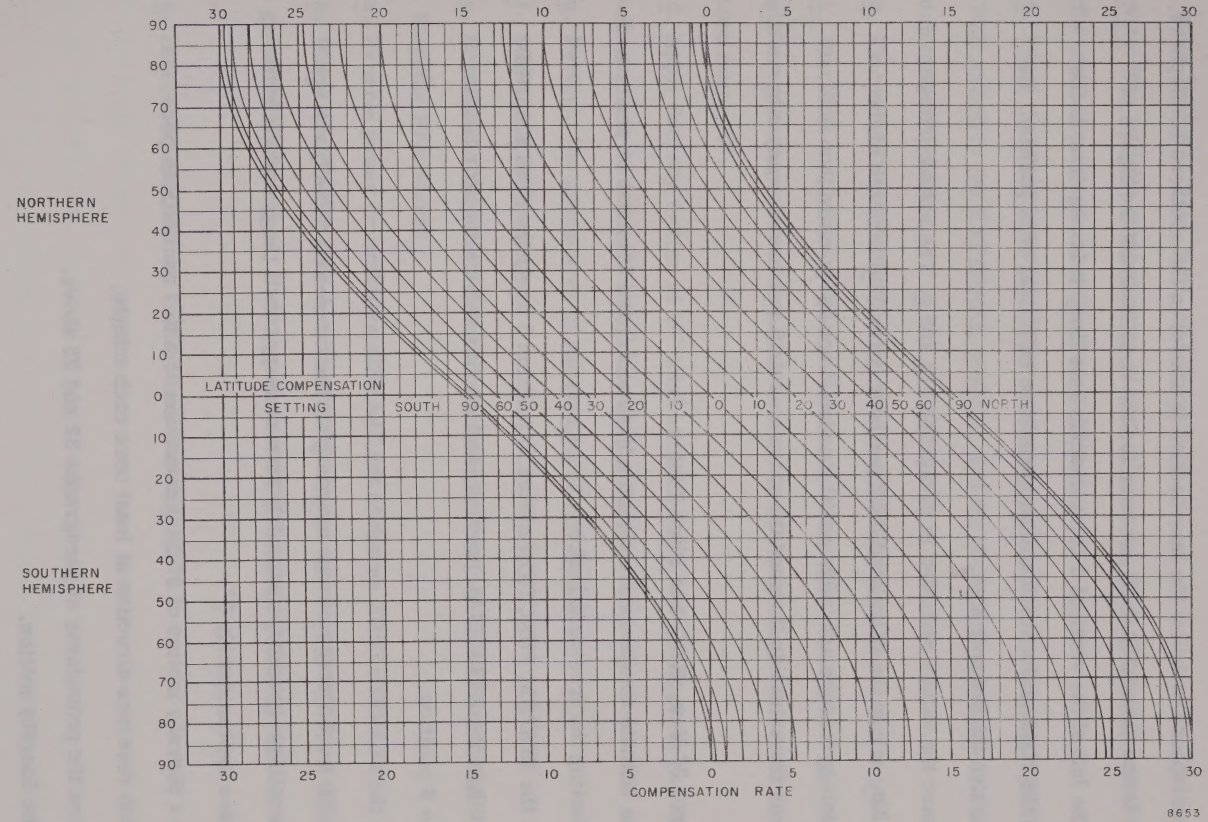


Figure 8. Latitude compensation and calculated drift rates.

d. Read the compensation rate directly above the intersection (c above) in the northern hemisphere or below the intersection (c above) in the southern hemisphere. This figure is the calculated drift per hour for the conditions. If the figure is located to the left of the vertical 0 compensation rate line, it is negative; if the figure is to the right of the vertical 0 compensation rate line, it is positive. Be careful to assign the correct sign.

e. Compare the values recorded in paragraph 32n and o. The actual drift per hour (para 32n) minus the calculated drift per hour (para 32o) for each of the four amplifier-gyroscope assembly positions should not differ more than 4.0° per hour from the actual drift minus the calculated drift per hour for any other position.

34. Free Drift 3° Yaw, Roll, and Pitch Test

Note: The latitude compensation circuit adjustment (para 26) must be performed before conducting the free-drift test.

a. Place the SYSTEM FUNCTION switch to position 3 or 4, the SYSTEM INDICATOR switch to the EXTERNAL position, and the flux valve simulator heading switch to the 0 position.

b. Place the SLAVED-FREE switch to the SLAVED position.

c. Place the amplifier-gyroscope assembly on the three-axis table (para 8a). Rotate the amplifier-gyroscope assembly as necessary, until the precision indicator indicates approximately 0°.

d. Apply a Scorsby motion of 3° total excursion at 5 to 7 oscillations per minute, which reverses direction at least once each minute.

e. Perform the procedures of paragraphs 32 and 33 above.

f. Stop the Scorsby motion.

g. Remove the amplifier-gyroscope assembly from the three-axis table.

35. Free Drift 15° Yaw, Roll, and Pitch Test

Note: The latitude compensation circuit adjustment (para 26 above) must be performed before conducting the free-drift test.

a. Place the SYSTEM FUNCTION switch to position 3 or 5, the SYSTEM INDICATOR switch to the EXTERNAL position, and the flux valve simulator heading switch to the 0 position.

b. Place the SLAVED-FREE switch to the SLAVED position.

c. Place the amplifier-gyroscope assembly on the three-axis table. Rotate the amplifier-gyroscope assembly as necessary, until the precision indicator indicates approximately 0°.

d. Apply Scorsby motion of 15° total excursion at 5 to 7 oscillations per minute which reverses direction at least once each minute.

e. Perform the procedures of paragraphs 32 and 33 above.

f. Stop the Scorsby motion.

g. Remove the amplifier-gyroscope assembly from the three-axis table.

36. Stopping Procedures

a. Remove power from the oscilloscope.

b. Place the POWER switch to the OFF position. The red POWER DC light, the green SYSTEM 1 light, and the yellow SYSTEM AUTO CUTOUT light should go out.

c. Disconnect the test set cables from the amplifier.

Section IV. OPERATING PROCEDURES, COMPASS SYSTEM MODEL (5005C) TESTS

Note: The preliminary, starting, and operating procedures of paragraphs 23 through 26 except the slaving rate check (para 30) are used when testing the compass system model (5005C). Paragraph 38 describes the slaving rate check for compass system (5005C). Paragraphs 39 and 40 describe additional checks used with compass system (5005C).

37. Compass System (5005C) Components

Compass system (5005C) consists of a gyroscope, a controller, and amplifier model 3303B. The connections of these components to the test set are the same as the connections for the components of compass system (5005A).

Note: The procedures of paragraphs 38 through 40 are used to test the amplifier-gyroscope assembly issued with the test set as well as those equipments being tested for field service.

38. Slaving Rate Test, Compass System (5005C).

a. Place the SYSTEM FUNCTION switch to position 3 and the flux valve simulator heading switch to the 0 position.

b. Place the SLAVED-FREE switch to the SLAVED position.

c. Place the amplifier-gyroscope assembly on the vibration table (para 8b). Check to see that the vibration table is level.

d. Apply vibration of 0.002 to 0.005-inch double amplitude at 1,500 to 2,000 cycles per minute to the vibration table.

e. Rotate the amplifier in the clockwise direction until the test set AZIMUTH indicator compass dial indicates 90° with respect to pointer 2, and immediately start a stopwatch.

f. Observe the test set AZIMUTH indicator compass dial. When the compass dial indicates 80° with respect to pointer 2, stop the stopwatch and record the time.

g. Rotate the amplifier-gyroscope in the counterclockwise direction until the AZIMUTH indicator compass dial indicates 270° with respect to pointer 2, and immediately start a stopwatch.

h. Observe the AZIMUTH indicator compass dial. When the compass dial indicates 280° with respect to pointer 2, stop the stopwatch and record the time.

i. Add the two times recorded in (f) and (h) above and divide the sum by 2 to determine the average time. The average time for the compass dial to move through 10° should be between 5 minutes and 9 minutes.

j. Hold the SET HDG. switch to the L or R position, as necessary, until the AZIMUTH indicator compass dial indicates 0° with respect to pointer 2.

k. Stop the vibration table.

39. Modulation Test

a. Place the SYSTEM FUNCTION switch to position 3.

b. Place the SLAVED-FREE switch to the FREE position.

c. Check to see that the vibration table is level.

d. Rotate the amplifier-gyroscope assembly in the clockwise or counterclockwise direction, as necessary, until the electronic voltmeter indicates 0.150 volt.

e. Adjust the oscilloscope, as necessary, to obtain 40 squares of vertical deflection, peak to peak.

f. Apply vibration of 1 G at 1,500 to 1,800 cycles per minute to the amplifier for a period of 30 to 60 seconds while performing step g below.

g. Move the SYSTEM FUNCTION switch to positions 3 and 4, alternately, while observing the oscilloscope. The modulation on peaks should not exceed 25 percent of the peak-to-peak voltage (10 squares).

h. Stop the vibration and remove the amplifier-gyroscope assembly from the vibration table.

40. Synchronizer Sensitivity Test

a. Place the amplifier-gyroscope assembly on the azimuth table and place the azimuth table and amplifier on the vibration table, with the amplifier connectors to the west.

b. Place the SYSTEM FUNCTION switch to position 3 and the flux valve simulator heading switch to the 0 position.

c. Apply vibration of 0.002 to 0.005 inch double amplitude at 1,500 to 2,000 cycles per minute to the vibration table.

d. Place the SLAVED-FREE switch to the SLAVED position.

e. Hold the SET HDG. switch to the L or R position, as necessary, until the precision indicator indicates 0.00°.

f. Rotate the azimuth table 0.25° in the clockwise direction, then 0.25° in the counterclockwise direction from zero. There should be a perceptible movement of the SYNC. IND. meter in each direction.

g. Rotate the azimuth table 2° in the clockwise direction, then 2° in the counterclockwise direction from zero. The SYNC. IND. meter pointer should not move beyond the meter scale.

h. Rotate the azimuth table 10° in the clockwise direction, then 10° in the counterclockwise direction from zero. The SYNC. IND. meter should indicate no less than full scale in each direction.

i. Stop vibration and remove the amplifier-gyroscope assembly and the azimuth table from the vibration table.

41. Stopping Procedures

a. Remove power from the oscilloscope.

b. Place the POWER switch to the OFF position. The red POWER DC light, the green SYSTEM 1 light and the yellow SYSTEM AUTO CUTOUT light should go out.

c. Disconnect the cables from the amplifier.

Section V. OPERATING PROCEDURES, AMPLIFIER MODEL 3303A or 3303B TESTS

Note: Amplifier Model 3303A consists of a slaving amplifier, leveling amplifier, transformer board, 110348-01, and chassis. Amplifier Model 3303B is the same as Model 3303A except that it contains transformer board 126084-01. The procedures of paragraphs 42 through 46 are used to test the amplifier issued with the test set as well as those being tested for field service.

42. Preliminary Procedures

a. Perform the applicable procedures of paragraph 16.

Caution: If cable W11 (connector P109) is connected to a leveling amplifier, disconnect it before connecting the amplifier to the test set.

b. Connect cable W8 (connector P531) to amplifier connector P101.

c. Connect cable W7 (connector P532) to amplifier connector P102.

d. Connect cable W9 (connector P106) to amplifier connector J106.

e. Connect cable W5 (connector P107) to amplifier connector J107.

f. Connect cable W3 (connector P108) to amplifier connector J108.

43. Starting Procedures

a. Apply power to the oscilloscope.

b. Place the COMPONENT TEST switch to position 2.

c. Place the POWER switch to the ON position and rotate the AC ADJUST control to the clockwise direction until the AC VOLTS meter indicates 115 volts. The red POWER DC light and the green AMPLIFIER 2 light should light; the DC VOLTS meter should indicate 27.5 volts ±0.5.

Caution: Place all test set switches and controls to the initial positions, unless instructed otherwise. Return all operated controls to the initial position upon completion of the test.

44. Voltage and Phase Test

a. Place the AMPLIFIER TORQUER FIXED Ø switch to SLAVING position. The electronic voltmeter indication should be 21 volts ±1.5 for amplifier model 3303A, and 22 volts ±2 for amplifier model 3303B.

b. Adjust the PHASE control to obtain an in-phase pattern on the oscilloscope. An in-phase pattern should be obtained with the PHASE control dial at approximately 0.

c. Place the AMPLIFIER TORQUER FIXED Ø switch to the LEVELING position. The electronic voltmeter indication should be 28 volts ±2 for amplifier model 3303A and 29 volts ±2 for amplifier 3303B.

d. Adjust the PHASE control to obtain an in-phase pattern on the oscilloscope. An in-phase pattern should be obtained with the PHASE control dial at approximately 0.

e. Return the AMPLIFIER TORQUER FIXED Ø switch to the center position.

f. Place the AMPLIFIER COMPASS TRANSMITTER switch to the EXCITATION position. The electronic voltmeter indication should be 23 volts ±2.

g. Place the AMPLIFIER COMPASS TRANSMITTER switch to the LAT COMP FIXED PHASE position. The electronic voltmeter indication should be 12.5 volts ±1.5.

h. Return the AMPLIFIER COMPASS TRANSMITTER switch to the center position.

i. Place the AMPLIFIER CUTOUT RELAY switch to the ON position. The electronic voltmeter indication should not exceed 1.0 volt.

j. Return the AMPLIFIER CUTOUT RELAY switch to the OFF position.

k. Place the AMPLIFIER MONITOR LAT CONT switch to the R101 position.

l. Rotate latitude compensation potentiometer R101 (located on the gyroscope shock mount) maximum counterclockwise. The test set electronic voltmeter indication should not exceed 0.5 volt.

m. Rotate latitude compensation potentiometer R101 maximum clockwise. The electronic voltmeter indication should be 7.6 volts ±1.0.

n. Adjust the PHASE control to obtain an in-phase pattern on the oscilloscope. An in-phase pattern should be obtained with the PHASE control dial between 50 LAG and 70 LAG.

o. Place the AMPLIFIER MONITOR LAT CONT switch in the R103 position.

p. Rotate balance potentiometer R103 (located on the gyroscope shock mount) maximum counterclockwise. The test set electronic voltmeter should indicate between 1.5 and 2.8 volts.

q. Slowly rotate balance potentiometer R103 maximum clockwise. The electronic voltmeter indication should decrease to near 0 volts then increase to between 1.5 and 2.8 volts.

r. Return the AMPLIFIER MONITOR LAT CONT switch to the center position.

45. Slaving Amplifier Tests

a. Rotate the SLAVING SIGNAL ADJUST control maximum counterclockwise.

b. Place the AMPLIFIER AMPL switch to the OUTPUT position. The electronic voltmeter indication should not exceed 2.5 volts.

c. Place the AMPLIFIER AMPL switch to the SHUNTED INPUT position.

d. Place the 800 CPS PHASE switch to the 0° position and adjust the SLAVING SIGNAL ADJUST control for an indication of 1.8 millivolts on the electronic voltmeter.

e. Place the test set AMPLIFIER AMPL switch in the OUTPUT position. The electronic voltmeter indication should be 5.6 volts ±0.8 for amplifier model 3303A and 6.5 volts ±0.5 for amplifier model 3303B. The DC CURRENT meter should deflect to the right and the indication should not exceed 50 microamperes.

f. Adjust the test set PHASE control to obtain an in-phase pattern on the oscilloscope. An in-phase pattern should be obtained with the PHASE control dial between 160 LEAD and 160 LAG.

g. Place the test set AMPLIFIER AMPL switch to the SHUNTED INPUT position.

h. Place the test set 800 CPS PHASE switch to the 180° position and adjust the SLAVING SIGNAL ADJUST control for an indication of 1.8 millivolts on the electronic voltmeter.

i. Place the AMPLIFIER AMPL switch to the OUTPUT position. The electronic voltmeter indication shall be 5.6 volts ±0.8 for amplifier model 3303A and 6.5 volts ±0.5 for amplifier 3303B. The DC CURRENT meter should deflect to the left and the indication should not exceed 50 microamperes.

j. Adjust the PHASE control to obtain an in-phase pattern on the oscilloscope. An in-phase pattern should be obtained with the PHASE control dial between 20 LEAD and 20 LAG.

k. Place the AMPLIFIER AMPL switch to the SHUNTED INPUT position.

l. Place the 800 CPS PHASE switch in the 0° position and adjust the SLAVING SIGNAL ADJUST control for an indication of 3.6 millivolts on the electronic voltmeter.

m. Place the AMPLIFIER AMPL switch to the OUTPUT position. The DC CURRENT meter should deflect to the right and the indication should be at least 50 microamperes.

n. Place the AMPLIFIER AMPL switch to the SHUNTED INPUT position.

o. Place the 800 CPS PHASE switch to the 180° position and adjust the SLAVING SIGNAL ADJUST control for an indication of 3.6 millivolts on the electronic voltmeter.

p. Place the AMPLIFIER AMPL switch to the OUTPUT position. The DC CURRENT meter should deflect to the left and the indication should be at least 50 microamperes.

q. Place the 800 CPS PHASE switch to the 0° position and rotate the SLAVING SIGNAL ADJUST control maximum counterclockwise.

r. Place the AMPLIFIER AMPL switch to the INPUT position.

46. Leveling Amplifier Tests

a. Place the COMPONENT TEST switch to position 3. The green AMPLIFIER 2 light should go out; the green LEVELING AMPLIFIER 3 light should come on.

b. Place the LEVELING AMPLIFIER SIGNAL switch to position ØB.

c. Place and hold the LEVELING AMPLIFIER VTVM switch to the INPUT position and adjust the LEVELING AMPLIFIER SIGNAL ADJUST control for an indication of 0.3 volt on the electronic voltmeter.

d. Return the LEVELING AMPLIFIER VTVM switch to the OUTPUT position. The electronic voltmeter indication should be at least 6.5 volts.

e. Adjust the PHASE control dial to obtain an in-phase pattern on the oscilloscope. An in-phase pattern should be obtained with the PHASE control dial at approximately 0.

f. Place the LEVELING AMPLIFIER SIGNAL switch to the ØB + 180° position.

g. Place and hold the LEVELING AMPLIFIER VTVM switch to the INPUT position and adjust the LEVELING AMPLIFIER SIGNAL ADJUST control for an indication of 0.3 volt on the electronic voltmeter.

h. Return the LEVELING AMPLIFIER VTVM switch to the OUTPUT position. The electronic voltmeter indication should be at least 6.5 volts.

i. Adjust the PHASE control dial to obtain an in-phase pattern on the oscilloscope. An in-phase pattern should be obtained with the PHASE control dial at approximately 180.

j. Rotate the LEVELING AMPLIFIER SIGNAL ADJUST control maximum counterclockwise.

k. Place the LEVELING AMPLIFIER SIGNAL switch to the ZERO position. The electronic voltmeter indication should not exceed 1.2 volt.

l. Place the LEVELING AMPLIFIER SIGNAL switch to the ØB position.

47. Stopping Procedures

a. Remove power from the oscilloscope.

b. Place the POWER switch to the OFF position. The red POWER DC light and the green LEVELING AMPLIFIER 3 light should go out.

c. Disconnect the cables from the amplifier.

Section VI. OPERATING PROCEDURES, LEVELING AMPLIFIER TESTS

Note: The procedures of paragraphs 48 through 51 are used to test leveling amplifiers issued with the test set as well as for testing amplifiers for field service.

48. Preliminary Procedures

a. Perform the applicable procedures of paragraph 16.

Caution: If cable W8 (connector P531) and cable W7 (connector P532) are connected to amplifier connectors P101 and P102, respectively, disconnect them before connecting the leveling amplifier to the test set.

b. Connect cable W11 (connector P109) to leveling amplifier connector P301.

49. Starting Procedures

a. Apply power to the oscilloscope.

b. Place the COMPONENT TEST switch to position 3.

c. Place the POWER switch to the ON position and rotate the AC ADJUST control in the clockwise direction until the AC VOLTS meter indicates 115 volts. The red POWER DC light and green LEVELING AMPLIFIER 3 light should light; the DC VOLTS meter should indicate 27.5 volts ±0.5.

50. Zero Signal Tests

a. Place the LEVELING AMPLIFIER SIGNAL switch to the ZERO position.

b. Place the test set LEVELING AMPLIFIER VTVM switch to the OUTPUT position. The electronic voltmeter indication should not exceed 0.5 volt.

51. Output Tests

a. Place the LEVELING AMPLIFIER SIGNAL switch to the ØB position.

b. Hold the LEVELING AMPLIFIER VTVM switch to the INPUT position and adjust the LEVELING AMPLIFIER SIGNAL ADJUST control for an indication of 80 millivolts on the electronic voltmeter.

c. Return the LEVELING AMPLIFIER VTVM switch to the OUTPUT position. The electronic voltmeter indication should be 4.8 volts ±0.7.

d. Adjust the test set PHASE control to obtain an in-phase pattern on the oscilloscope. An in-phase pattern should be obtained with the PHASE control dial between 15 LEAD and 15 LAG.

e. Hold the LEVELING AMPLIFIER VTVM switch to the INPUT position and adjust the LEVELING AMPLIFIER SIGNAL ADJUST control for an indication of 0.3 volt on the electronic voltmeter.

f. Return the LEVELING AMPLIFIER VTVM switch to the OUTPUT position. The electronic voltmeter indication should be at least 7.0 volts.

g. Hold the LEVELING AMPLIFIER VTVM switch to the INPUT position and adjust the LEVELING AMPLIFIER SIGNAL ADJUST control for an indication of 5.0 volts on the electronic voltmeter.

h. Return the LEVELING AMPLIFIER VTVM switch to the OUTPUT position. The electronic voltmeter indication should be at least 7.0 volts.

i. Rotate the LEVELING AMPLIFIER SIGNAL ADJUST control maximum counterclockwise.

52. Stopping Procedures

a. Remove power from the oscilloscope.

b. Place the POWER switch to the OFF position. The red POWER DC light and the green LEVELING AMPLIFIER 3 light should go out.

c. Disconnect the cable from the leveling amplifier.

Section VII. OPERATING PROCEDURES, SLAVING AMPLIFIER TESTS

Note: The procedures of paragraphs 53 through 56 are used to test slaving amplifiers issued with the test set as well as in testing amplifiers for field service.

53. Preliminary Procedures

a. Perform the applicable procedures of paragraph 16.

b. Connect cable W14 (connector P110) to slaving amplifier connector P401.

54. Starting Procedures

a. Place the COMPONENT TEST switch to position 4.

b. Place the POWER switch to the ON position and rotate the AC ADJUST control in the clockwise direction until the AC VOLTS meter indicates 115 volts. The red POWER DC light and the green SLAVING AMPLIFIER 4 light should light.

55. Supply Voltage Tests

a. Place the SLAVING AMPLIFIER FUNCTION switch to position 1.

b. Place the SLAVING AMPLIFIER MONITOR SLAVING switch to the SUPPLY 1 position. The DC VOLTS meter should indicate 45.3 volts ±1.8.

c. Place the SLAVING AMPLIFIER MONITOR SLAVING switch to the SUPPLY 2 position. The DC VOLTS meter should indicate 45.3 volts ±1.8.

d. Place the SLAVING AMPLIFIER MONITOR SLAVING switch to the OUTPUT position. The DC VOLTS meter should indicate 24.5 volts ±2.

56. Output Tests

a. Place the SLAVING AMPLIFIER FUNCTION switch to position 1 and rotate the SLAVING SIGNAL ADJUST potentiometer maximum counterclockwise. The DC CURRENT meter indication should not exceed 75 microamperes left or right of center.

b. Place the SLAVING AMPLIFIER FUNCTION switch to position 2.

Note: Position 2 of the SLAVING AMPLIFIER FUNCTION switch connects a shunt across the DC CURRENT meter to provide a full-scale deflection of 1-0-1 milliampere.

c. Rotate the SLAVING SIGNAL ADJUST control in the clockwise direction until the electronic voltmeter indicates 1.8 millivolts. The DC CURRENT meter should deflect to the right and indicate 70 microamperes ±8.

Note: A DC CURRENT meter indication of 70 microamperes ±8 corresponds to an output current of 700 microamperes ±80.

d. Place the 800 CPS PHASE switch to 180° position.

e. Adjust the SLAVING SIGNAL ADJUST control to obtain an indication of 1.8 millivolts on the electronic voltmeter. The DC CURRENT meter should deflect to the left and indicate 70 microamperes ±8.

Note: A DC CURRENT meter indication of 70 microamperes ±8 corresponds to an output current of 700 microamperes ±80.

f. Place the 800 CPS PHASE switch to the 0° position.

g. Adjust the SLAVING SIGNAL ADJUST control for an indication of 3.6 millivolts on the electronic voltmeter. The DC CURRENT meter should deflect to the right and indicate at least 90 microamperes.

Note: A DC CURRENT meter indication of 90 microamperes corresponds to an output current of 900 microamperes.

h. Place the 800 CPS PHASE switch to the 180° position.

i. Adjust the SLAVING SIGNAL ADJUST control to obtain an indication of 3.6 millivolts on the electronic voltmeter. The DC CURRENT meter should deflect to the left and indicate at least 90 microamperes.

Note: A DC CURRENT meter indication of 90 microamperes corresponds to an output current of 900 microamperes.

j. Place the 800 CPS PHASE switch to 0° position and rotate the SLAVING SIGNAL ADJUST potentiometer maximum counterclockwise.

k. Place the SLAVING AMPLIFIER FUNCTION switch to position 1 and the SLAVING AMPLIFIER MONITOR SLAVING switch in the SUPPLY 2 position.

57. Stopping Procedures

a. Remove power from the oscilloscope.

b. Place the POWER switch to the OFF position. The red POWER DC light and the green SLAVING AMPLIFIER 4 light should go out.

c. Disconnect the cable from the slaving amplifier.

Section VIII. OPERATING PROCEDURES, TRANSFORMER BOARD 110348-01 TESTS

Note: The procedures of paragraphs 58 through 61 are used to test transformer boards issued with the test set as well as in testing transformer boards for field service.

58. Preliminary Procedures

a. Perform the applicable procedures of paragraph 16.

b. Connect cable W15 (connectors P103 and P104) to transformer board 110348-01. Plug transformer board connector J202 into cable connector P103; plug transformer board connector J201 into cable connector P104.

c. Place the TRANSFORMER BOARD 3303A-3303B switch in the 3303A position.

59. Starting Procedures

a. Apply power to the oscilloscope.

b. Place the test set COMPONENT TEST switch in the 5 position.

c. Place the test set POWER switch in the ON position and rotate the AC ADJUST autotransformer in the clockwise direction until the AC VOLTS meter indicates 115 volts. The red POWER DC light and the green TRANSFORMER BOARD 5 light shall come on.

60. Voltage Output Tests

a. Place the TRANSFORMER BOARD FUNCTION switch to position 1.

b. Observe the electronic voltmeter. The electronic voltmeter should indicate 23 volts ±2.

c. Place the TRANSFORMER BOARD DISCRIMINATOR REFERENCE switch to the ØA position. The DC VOLTS meter should indicate 46.5 volts ±3.5.

d. Place the TRANSFORMER BOARD DISCRIMINATOR REFERENCE switch to the ØB position. The DC VOLTS meter should indicate 46.5 volts ±3.5.

e. Place the TRANSFORMER BOARD FUNCTION switch to position 2. The electronic voltmeter should indicate 25.5 volts ±4.

f. Place the TRANSFORMER BOARD FUNCTION switch to position 3. The electronic voltmeter should indicate 25.5 volts ±4.

g. Adjust the PHASE control to obtain an in-phase pattern on the oscilloscope. An in-phase pattern should be obtained with the PHASE control dial between 5 LEAD and 5 LAG.

h. Place the TRANSFORMER BOARD FUNCTION switch to position 4. The electronic voltmeter should indicate 29 volts ±3.

i. Adjust the PHASE control to obtain an in-phase pattern on the oscilloscope. An in-phase pattern should be obtained with the PHASE control dial between 5 LEAD and 5 LAG.

j. Place the TRANSFORMER BOARD FUNCTION switch to position 5. The electronic voltmeter should indicate near 0 volts when the range switch is in position 1.

k. Place the TRANSFORMER BOARD FUNCTION switch to position 6. The electronic voltmeter should indicate 23 volts ±2.

l. Adjust the PHASE control to obtain an in-phase pattern on the oscilloscope. An in-phase pattern should be obtained with the PHASE control dial between 5 LEAD and 5 LAG.

m. Place the TRANSFORMER BOARD FUNCTION switch to position 7. The electronic voltmeter should indicate 5.5 volts ±2.5.

61. Signal Output Tests

a. Place the TRANSFORMER BOARD FUNCTION switch to position 8.

b. Depress the TRANSFORMER BOARD NULL switch.

c. Adjust the TRANSFORMER BOARD MIN OUTPUT ADJUST control to obtain a minimum or null indication on the electronic voltmeter. The minimum indication on the electronic voltmeter should not exceed 0.5 volt. The DC CURRENT meter indication should not exceed 75 microamperes left or right of center.

Note: When the TRANSFORMER BOARD NULL switch is depressed, the DC CURRENT meter full-scale deflection is 100-0-100 microamperes.

d. Release the TRANSFORMER BOARD NULL switch.

e. Place the TRANSFORMER BOARD FUNCTION switch to position 9.

f. Adjust the TRANSFORMER BOARD DC ADJUST control for 50 microamperes right deflection of the DC CURRENT meter. The electronic voltmeter indication should be at least 4.8 volts.

Caution: Do not depress the TRANSFORMER BOARD NULL switch. The NULL switch shunts the DC CURRENT meter to provide a full-scale deflection of 1-0-1 milliampere when closed. A 50-microampere DC CURRENT meter indication corresponds to a 500-microampere signal current.

g. Place the TRANSFORMER BOARD FUNCTION switch to position 10.

h. Adjust the TRANSFORMER BOARD DC ADJUST control for 50 microamperes left deflection of the DC CURRENT meter. The electronic voltmeter indication should be at least 4.8 volts. The phase of the voltage should be reversed from that of f above.

Caution: Do not depress the TRANSFORMER BOARD NULL switch. The 50-microampere DC CURRENT meter indication corresponds to a 500-microampere signal current.

i. Place the TRANSFORMER BOARD FUNCTION switch to position 11.

j. Adjust the TRANSFORMER BOARD DC ADJUST control for 100 microamperes right deflection of the DC CURRENT meter. The electronic voltmeter indication should be between 5.0 and 6.3 volts. Record the value.

Caution: Do not depress the TRANSFORMER BOARD NULL switch. The 100-microampere DC CURRENT meter indication corresponds to a 1.0-milliampere signal current.

k. Adjust the PHASE control to obtain an in-phase pattern on the oscilloscope. An in-phase pattern should be obtained with the PHASE control dial between 10 LEAD and 10 LAG.

l. Place the TRANSFORMER BOARD FUNCTION switch to position 12.

m. Adjust the TRANSFORMER BOARD DC ADJUST control for 100 microamperes left deflection of the DC CURRENT meter. The electronic voltmeter indication should be between 5.0 and 6.3 volts and within 0.5 volt of the value recorded in j above.

Caution: Do not depress the TRANSFORMER BOARD NULL switch. The 100-microampere DC CURRENT meter indication corresponds to a 1.0-milliampere signal current.

n. Adjust the PHASE control to obtain an in-phase pattern on the oscilloscope. An in-phase pattern should be obtained with the PHASE control dial between 170 LEAD and 170 LAG.

62. Stopping Procedures

a. Place the TRANSFORMER BOARD FUNCTION switch in position 1.

b. Remove power from the oscilloscope.

c. Place the POWER switch to the OFF position. The red POWER DC light and the green TRANSFORMER BOARD 5 light should go out.

d. Disconnect cable W15 from the transformer board.

Section IX. OPERATING PROCEDURES, TRANSFORMER BOARD 126094-01 or 126094-02 TESTS

Note: The procedures of paragraphs 63 through 65 are to be used to test transformer boards issued with the test set as well as in testing transformer boards for field service.

63. Preliminary Procedures

a. Perform the applicable procedures of paragraph 16.

b. Connect cable W15 (connectors P103 and P104) to the transformer board. Plug transformer board connector J202 into cable connector P103; plug transformer board connector J201 into cable connector P104.

c. Place set TRANSFORMER BOARD 3303A-3303B switch in the 3303B 1 position.

64. Starting Procedures

a. Apply power to the oscilloscope.

b. Place the COMPONENT TEST switch to position 5.

c. Place the POWER switch to the ON position and rotate the AC ADJUST control in the clockwise direction until the AC VOLTS meter indicates 115 volts. The red POWER DC light and the green TRANSFORMER BOARD 5 light should light.

Caution: All test set lever switches are to be in the neutral or center position unless instructed otherwise, and returned to the center position upon completion of the test.

65. Voltage Output Tests

a. Place the TRANSFORMER BOARD FUNCTION switch to position 1.

b. Observe the electronic voltmeter. The electronic voltmeter should indicate 23 volts ±2.

c. Place the TRANSFORMER BOARD DISCRIMINATOR REFERENCE switch to the ØA position. The DC VOLTS meter should indicate 46.5 volts ±3.5.

d. Place the TRANSFORMER BOARD DISCRIMINATOR REFERENCE switch to the ØB position. The DC VOLTS meter should indicate 46.5 volts ±3.5.

e. Place the TRANSFORMER BOARD FUNCTION switch to position 2. The electronic voltmeter should indicate 12.5 volts ±1.3 for transformer board 126094-01 and 12.5 volts ±0.3 for transformer board 126094-02.

f. Place the TRANSFORMER BOARD 3303A 3303B switch to the 3303B position 2 and the TRANSFORMER BOARD FUNCTION switch to position 3. The electronic voltmeter should indicate 6.3 volts ±0.8.

g. Adjust the PHASE control to obtain an in-phase pattern on the oscilloscope. An in-phase pattern should be obtained with the PHASE control dial between 50 LAG and 70 LAG.

h. Place the TRANSFORMER BOARD 3303A-3303B switch to the 3303B position 3. The electronic voltmeter indication should not exceed 0.48 volt.

i. Place the TRANSFORMER BOARD 3303A-3303B switch to the 3303B position 1 and the FUNCTION switch to position 4. The electronic voltmeter should indicate 29 volts ±3.

j. Adjust the PHASE control to obtain an in-phase pattern on the oscilloscope. An in-phase pattern should be obtained with the PHASE control dial between 5 LEAD and 5 LAG.

k. Place the TRANSFORMER BOARD FUNCTION switch to position 5. The electronic voltmeter should indicate near 0 volts when the range switch is at position 1.

l. Place the TRANSFORMER BOARD FUNCTION switch to position 6. The electronic voltmeter should indicate 23 volts ±2.

m. Adjust the PHASE control to obtain an in-phase pattern on the oscilloscope. An in-phase pattern should be obtained with the PHASE control dial between 5 LEAD and 5 LAG.

n. Place the TRANSFORMER BOARD FUNCTION switch to position 7. The electronic voltmeter should indicate 5.5 volts ±2.5.

66. Signal Output Tests

a. Place the TRANSFORMER BOARD 3303A-3303B switch to the 3303B position 2 and the TRANSFORMER BOARD FUNCTION switch in position 8.

b. Depress the TRANSFORMER BOARD NULL switch.

c. Adjust the TRANSFORMER BOARD MIN OUTPUT ADJUST control to obtain a minimum or null indication on the electronic voltmeter. The minimum indication on the electronic voltmeter should not exceed 0.5 volt. The DC CURRENT meter indication should not exceed 75 microamperes left or right of center.

Note: When the TRANSFORMER BOARD NULL switch is depressed, the DC CURRENT meter full-scale deflection is 100-0-100 microamperes.

d. Release the TRANSFORMER BOARD NULL switch.

e. Place the TRANSFORMER BOARD FUNCTION switch in position 9.

f. Adjust the TRANSFORMER BOARD DC ADJUST control for 50 microamperes right deflection of the DC CURRENT meter. The electronic voltmeter indication should be at least 6.0 volts.

Caution: Do not depress the TRANSFORMER BOARD NULL switch. The NULL switch shunts the DC CURRENT meter to provide a full-scale deflection of 1-0-1 milliampere when closed. A 50-microampere DC CURRENT meter indication corresponds to a 500-microampere signal current.

g. Place the TRANSFORMER BOARD FUNCTION switch to position 10.

h. Adjust the TRANSFORMER BOARD DC ADJUST control for 50 microamperes left deflection of the DC CURRENT meter. The electronic voltmeter indication should be at leat 6.0 volts. The phase of the voltage should be reversed from that of f above.

Caution: Do not depress the TRANSFORMER BOARD NULL switch. The 50 microampere DC CURRENT meter indication corresponds to a 500-microampere signal current.

i. Place the TRANSFORMER BOARD FUNCTION switch to position 11.

j. Adjust the TRANSFORMER BOARD DC ADJUST control for 100 microamperes right deflection of the DC CURRENT meter. The electronic voltmeter should indicate between 6.2 and 7.0 volts. Record the value.

Caution: Do not depress the TRANSFORMER BOARD NULL switch. The 100-microampere DC CURRENT meter indication corresponds to 1.0 milliampere signal current.

k. Adjust the PHASE control to obtain an in-phase pattern on the oscilloscope. An in-phase pattern should be obtained with the PHASE control dial between 10 LEAD and 10 LAG.

l. Place the TRANSFORMER BOARD FUNCTION switch to position 12.

m. Adjust set TRANSFORMER BOARD DC ADJUST control for 100 microamperes left deflection of the DC CURRENT meter. The electronic voltmeter indication should be between 6.2 and 7.0 volts, and within 0.5 volt of the value recorded in i above.

Caution: Do not depress the TRANSFORMER BOARD NULL switch. The 100-microampere DC CURRENT meter indication corresponds to a 1.0-milliampere signal current.

n. Adjust the PHASE control to obtain an in-phase pattern on the oscilloscope. An in-phase pattern should be obtained with the PHASE control dial between 170 LEAD and 170 LAG.

67. Stopping Procedures

a. Place the TRANSFORMER BOARD FUNCTION switch in position 1.

b. Remove power from the oscilloscope.

c. Place the POWER switch in the OFF position. The red POWER DC light and the green TRANSFORMER BOARD 5 light should go out.

d. Disconnect cable W15 from the transformer board.

68. Complete Shut-down Procedures

a. Place the COMPONENT TEST switch in position 1.

b. Place all switches and controls in their initial positions. (para 20 o)

c. Rotate the AC ADJUST control to its maximum counterclockwise position.

d. Place the POWER switch to the OFF position. The red POWER DC light should go out.

e. Remove power from the oscilloscope and disconnect it from the test set.

f. Disconnect the test set cables from the components under test.

g. Disconnect the precision indicator and precision indicator amplifier from the test set.

h. Disconnect cables W1 and W2 from the ac and dc power sources.

i. Store all test set cables in the cable storage compartment.

j. Replace the cover on the test set.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

69. General

Organizational maintenance functions to be performed on the test set are outlined below.

a. Operator's Maintenance (First Echelon). Operator's maintenance consists of preventive maintenance checklist items 1 through 11 (para 70), and the following:

(1) Visual inspection (para 71).

(2) Rotary switch knob index or pointer alignment (para 73b).

b. Second Echelon Maintenance. Second echelon maintenance consists of a above, as required, preventive maintenance checklist items 12 through 25, and the following:

(1) Replacement of indicator light bulbs (para 72a).

(2) Replacement of fuses (para 72b).

(3) Meter zero-set adjustment (para 73a).

(4) Replacement of knobs (para 73b).

c. Tools and Materials Required. The following tools and materials are required to perform first and second echelon maintenance:

(1) Screwdriver
(2) Electrical tape
(3) Cleaning compound (FSN 7930-395-9542)
(4) Clean, lint - free cloth.

70. Preventive Maintenance

a. DA Form 11-266 (fig. 9 and 10). Items 1 through 11 on DA Form 11-266 are normally performed by the operator. Items not applicable to this test set are lined out on the figures. References in the ITEM block in the figures are to paragraphs which contain supplementary information pertaining to particular items. Instructions for use of the form appear on the form.

Note: The DA Form 11-266 shown in figures 9 and 10 is provided as an example of the extent of preventive maintenance that should be performed on the test set. The individual responsible for maintenance should modify the form to fit the maintenance requirements in order to reduce the possibility of equipment failure.

Warning: Disconnect cable W1 and cable W2 from the ac and dc power sources before performing any maintenance procedures.

b. Items.

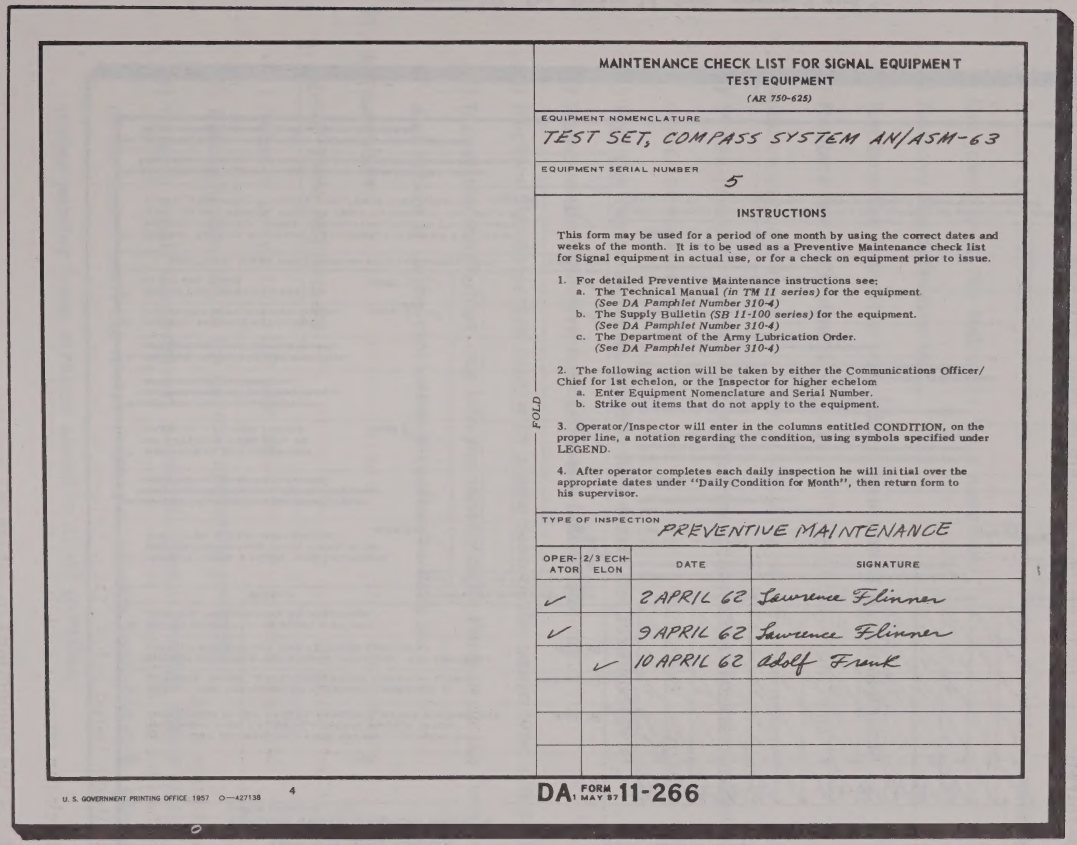
Item	Maintenance procedure
1	a. For cleaning, if necessary, moisten a cloth or brush with Cleaning Compound (FSN 7930-395-9542); after cleaning wipe dry with a cloth. Do not use cleaning compound on electrical contacts. Warning: Cleaning compound is flammable and its fumes are toxic. Do not use near a flame; provide adequate ventilation. b. Dry, compressed air, not exceeding 60 pounds per square inch, may be used to remove dust from inaccessible places. Warning: Compressed air is dangerous and can cause serious damage to eyes, ear, nose, and other parts of the body. It also can cause mechanical damge to the equipment. Do not use compressed air to dry parts where cleaning compound has been applied.
7	Check portable case cover for proper sealing on case and correct latching of the spring catches.

71. Visual Inspection

When the test set fails to perform properly, turn off the power and check for all of the items listed below. Do not check the test set with the power applied.

a. Check for correct switch and control settings.

b. Check the connections of cables W1 and W2.



MAINTENANCE CHECK LIST FOR SIGNAL EQUIPMENT
TEST EQUIPMENT
(AR 750-625)

EQUIPMENT NOMENCLATURE
TEST SET, COMPASS SYSTEM AN/ASM-63

EQUIPMENT SERIAL NUMBER
5

INSTRUCTIONS

This form may be used for a period of one month by using the correct dates and weeks of the month. It is to be used as a Preventive Maintenance check list for Signal equipment in actual use, or for a check on equipment prior to issue.

1. For detailed Preventive Maintenance instructions see:
   a. The Technical Manual *(in TM 11 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   b. The Supply Bulletin *(SB 11-100 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   c. The Department of the Army Lubrication Order. *(See DA Pamphlet Number 310-4)*

2. The following action will be taken by either the Communications Officer/ Chief for 1st echelon, or the Inspector for higher echelon
   a. Enter Equipment Nomenclature and Serial Number.
   b. Strike out items that do not apply to the equipment.

3. Operator/Inspector will enter in the columns entitled CONDITION, on the proper line, a notation regarding the condition, using symbols specified under LEGEND.

4. After operator completes each daily inspection he will initial over the appropriate dates under "Daily Condition for Month", then return form to his supervisor.

FOLD

TYPE OF INSPECTION PREVENTIVE MAINTENANCE

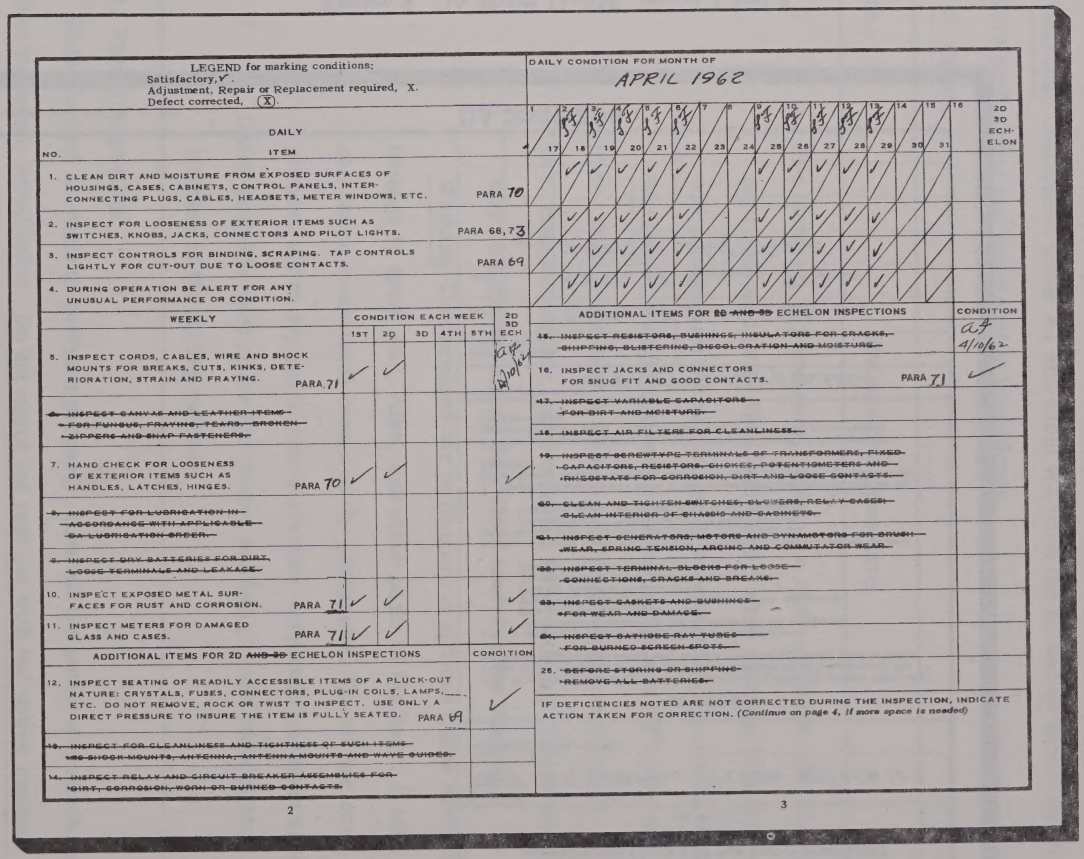
OPERATOR	2/3 ECHELON	DATE	SIGNATURE
✓		2 APRIL 62	Lawrence Flinner
✓		9 APRIL 62	Lawrence Flinner
	✓	10 APRIL 62	Adolf Frank

U. S. GOVERNMENT PRINTING OFFICE 1957 O—427138

4

DA FORM 1 MAY 57 11-266

Figure 9. DA Form 11-266, pages 1 and 4.



LEGEND for marking conditions:
Satisfactory, ✓.
Adjustment, Repair or Replacement required, X.
Defect corrected, (X).

DAILY CONDITION FOR MONTH OF APRIL 1962

NO.	DAILY ITEM	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	2D 3D ECHELON
		17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
1.	CLEAN DIRT AND MOISTURE FROM EXPOSED SURFACES OF HOUSINGS, CASES, CABINETS, CONTROL PANELS, INTERCONNECTING PLUGS, CABLES, HEADSETS, METER WINDOWS, ETC. PARA 70	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓					
2.	INSPECT FOR LOOSENESS OF EXTERIOR ITEMS SUCH AS SWITCHES, KNOBS, JACKS, CONNECTORS AND PILOT LIGHTS. PARA 68, 73	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓						
3.	INSPECT CONTROLS FOR BINDING, SCRAPING. TAP CONTROLS LIGHTLY FOR CUT-OUT DUE TO LOOSE CONTACTS. PARA 69	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓						
4.	DURING OPERATION BE ALERT FOR ANY UNUSUAL PERFORMANCE OR CONDITION.	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓						

WEEKLY	CONDITION EACH WEEK 1ST	2D	3D	4TH	5TH	2D 3D ECH
5. INSPECT CORDS, CABLES, WIRE AND SHOCK MOUNTS FOR BREAKS, CUTS, KINKS, DETERIORATION, STRAIN AND FRAYING. PARA 71	✓	✓				
~~6. INSPECT CANVAS AND LEATHER ITEMS FOR FUNGUS, FRAYING, TEARS, BROKEN ZIPPERS AND SNAP FASTENERS.~~						
7. HAND CHECK FOR LOOSENESS OF EXTERIOR ITEMS SUCH AS HANDLES, LATCHES, HINGES. PARA 70	✓	✓				✓
~~8. INSPECT FOR LUBRICATION IN ACCORDANCE WITH APPLICABLE DA LUBRICATION ORDER.~~						
~~9. INSPECT DRY BATTERIES FOR DIRT, LOOSE TERMINALS AND LEAKAGE.~~						
10. INSPECT EXPOSED METAL SURFACES FOR RUST AND CORROSION. PARA 71	✓	✓				✓
11. INSPECT METERS FOR DAMAGED GLASS AND CASES. PARA 71	✓	✓				✓

ADDITIONAL ITEMS FOR ~~2D AND 3D~~ ECHELON INSPECTIONS	CONDITION
12. INSPECT SEATING OF READILY ACCESSIBLE ITEMS OF A PLUCK-OUT NATURE; CRYSTALS, FUSES, CONNECTORS, PLUG-IN COILS, LAMPS, ETC. DO NOT REMOVE, ROCK OR TWIST TO INSPECT. USE ONLY A DIRECT PRESSURE TO INSURE THE ITEM IS FULLY SEATED. PARA 69	✓
~~13. INSPECT FOR CLEANLINESS AND TIGHTNESS OF SUCH ITEMS AS SHOCK MOUNTS, ANTENNA, ANTENNA MOUNTS AND WAVE GUIDES.~~	
~~14. INSPECT RELAY AND CIRCUIT BREAKER ASSEMBLIES FOR DIRT, CORROSION, WORN OR BURNED CONTACTS.~~	

ADDITIONAL ITEMS FOR ~~2D AND 3D~~ ECHELON INSPECTIONS	CONDITION
~~15. INSPECT RESISTORS, BUSHINGS, INSULATORS FOR CRACKS, CHIPPING, BLISTERING, DISCOLORATION AND MOISTURE.~~	AJF 4/10/62
16. INSPECT JACKS AND CONNECTORS FOR SNUG FIT AND GOOD CONTACTS. PARA 71	✓
~~17. INSPECT VARIABLE CAPACITORS FOR DIRT AND MOISTURE.~~	
~~18. INSPECT AIR FILTERS FOR CLEANLINESS.~~	
~~19. INSPECT SCREWTYPE TERMINALS OF TRANSFORMERS, FIXED CAPACITORS, RESISTORS, CHOKES, POTENTIOMETERS AND RHEOSTATS FOR CORROSION, DIRT AND LOOSE CONTACTS.~~	
~~20. CLEAN AND TIGHTEN SWITCHES, BLOWERS, RELAY CASES; CLEAN INTERIOR OF CHASSIS AND CABINETS.~~	
~~21. INSPECT GENERATORS, MOTORS AND DYNAMOTORS FOR BRUSH WEAR, SPRING TENSION, ARCING AND COMMUTATOR WEAR.~~	
~~22. INSPECT TERMINAL BLOCKS FOR LOOSE CONNECTIONS, CRACKS AND BREAKS.~~	
~~23. INSPECT GASKETS AND BUSHINGS FOR WEAR AND DAMAGE.~~	
~~24. INSPECT CATHODE RAY TUBES FOR BURNED SCREEN SPOTS.~~	
25. ~~BEFORE STORING OR SHIPPING REMOVE ALL BATTERIES.~~	

IF DEFICIENCIES NOTED ARE NOT CORRECTED DURING THE INSPECTION, INDICATE ACTION TAKEN FOR CORRECTION. *(Continue on page 4, if more space is needed)*

2 3

Figure 10. DA Form 11-266, pages 2 and 3.

c. Check for blown fuses.

d. Check to see that the test set cables are securely and properly connected to the test set and the components being tested.

e. Check cables for signs of obvious damage or wear.

72. Repairs and Replacement

a. Replacement of Indicator Light Bulbs.

(1) Rotate the indicator jewel in the counterclockwise direction and remove the jewel from the indicator light assembly.

(2) Remove the defective bulb.

(3) Replace the defective bulb with a new one of identical rating.

(4) Replace the indicator jewel.

b. Replacement of Fuses.

(1) Press in on the fuseholder cap and rotate it in the counterclockwise direction to unlock it.

(2) Pull the fuseholder cap and the fuse out of the fuseholder.

(3) Remove the defective fuse from the fuseholder cap.

(4) Replace the defective fuse with a new fuse of the same type and rating.

(5) Insert the fuseholder cap into the fuseholder. Push in on the fuseholder cap and rotate it in the clockwise direction to lock it.

73. Adjustments

a. Meter Zero Adjustment.

(1) Remove power from the test set.

(2) Place the test set in its normal operating position.

(3) Using a small screwdriver, adjust the meter zeroing screw on the front of the meter until the meter pointer is exactly centered to 0. Observe the meter pointer from straight ahead to avoid parallax.

b. Rotary Switch Knob Index or Pointer Alignment. Align the knob indexes or the pointers of the various rotary controls or switches except the PHASE control dial and the flux valve simulator heading switch as described in (1) through (4) below:

Note: Alignment of the indexes on the flux valve simulator heading switch and the PHASE control dial must be accomplished by higher echelon maintenance personnel. This alignment must not be attempted by the operator or organizational maintenance personnel.

(1) Rotate the switch to its extreme counterclockwise position.

(2) Loosen the setscrews that secure the knob to the shaft.

(3) Align the knob index or pointer with the extreme counterclockwise index line on the panel and tighten the setscrews.

(4) Rotate the switch to each of its positions and check the alignment of the knob index or pointer.

(5) If the index or pointer is in error at any of the positions, it may be necessary to change the setting made in (3) above so that the error is evenly distributed.

CHAPTER 5

DEMOLITION OF MATERIEL TO PREVENT ENEMY USE

74. Authority for Demolition

The demolition procedures in paragraph 75 will be used to prevent the enemy from using or salvaging any parts of the test set. Demolition of the test set will be accomplished only upon the order of the commander.

75. Methods of Destruction

Any or all of the methods of destruction below may be used. The time available will determine how the destruction will be carried out. In most cases, it is preferable to demolish completely some portions of the test set rather than partially destroy all the components.

a. Smash. Smash the test set components; use sledges, axes, hammers, crowbars, and any other heavy tools available.

b. Cut. Cut the test set power and test cables and internal cable harnesses; use axes, handaxes, machetes, and similar tools.

c. Burn. Burn as much of the equipment as is flammable; use gasoline, oil, flamethrowers, and similar flammables. Burn the instruction literature first. Pour gasoline on the cut cables and internal wiring and ignite it. Use a flamethrower to burn spare parts or pour gasoline on the spares, and ignite them. Use incendiary grenades to complete the destruction of the test set.

Warning: Be extremely careful with explosives and incendiary devices. Use these items only when the need is urgent.

d. Explode. Use explosives to complete demolition or to cause maximum damage, before burning, when time does not permit complete demolition by other means. Powder charges, fragmentation grenades, or incendiary grenades may be used. Incendiary grenades usually are most effective.

e. Dispose. Bury or scatter destroyed parts or throw them into nearby waterways. This is particularly important if a number of parts have not been completely destroyed.

APPENDIX I

REFERENCES

SB 38-100	Preservation, Packaging and Packing Materials, Supplies, and Equipment Used by the Army.
TM 11-5131	Oscilloscopes OS-5001/U, OS-5001A/U OS-46/U and OS-46A/U.
TM 11-6615-214-15	Operator's, Organizational, Field and Depot Maintenance: Navy Type MA-1 Compass (Lear).
TM 11-6625-200-12	Operation and Organizational Maintenance: Multimeter ME-26B/U

HEADQUARTERS,
DEPARTMENT OF THE ARMY
Washington 25, D. C., 30 August 1962

TM 11-6625-503-12, Operator and Organizational Maintenance Manual: Test Set, Compass System AN/ASM-63 and Simulator, Compass Transmitter SM-272/ASN, is furnished for the use of all concerned.

By Order of the Secretary of the Army:

G. H. DECKER,
General, United States Army,
Chief of Staff.

Official:
J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

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